

# It All Begins With The Seed!



# Published by the Alberta Canola Producers Commission



The mission of Alberta Canola is to support the long-term success of canola farmers in Alberta through research, extension, consumer engagement, and advocacy for canola farmers.

---

Alberta Canola Producers Commission  
14560 116 Avenue NW  
Edmonton, Alberta, Canada  
T5M 3E9

**Phone:** [780] 454-0844  
**Fax:** [780] 451-6933  
**[www.learncanola.com](http://www.learncanola.com)**  
**[www.albertacanola.com](http://www.albertacanola.com)**

---

Alberta Canola Producers Commission gratefully acknowledges the following groups and individuals who have participated in the development of this activity booklet. If you have topic ideas, suggestions, please do not hesitate to contact us or visit **[www.learncanola.com](http://www.learncanola.com)**

## Project Development

Tara Baycroft, Alberta Canola  
Michelle Chunyua, Alberta Canola

Thank you to the teachers who participated in the development of this activity booklet.

## Resource Design & Illustrations

Pulp Studios Inc.  
James Grasdal



**Welcome to the Duffy farm! Meet Chase, his sister Amelia,  
and Grandma and Grandpa Duffy.**

**Chase and Amelia often visit their grandparents  
at the farm and learn about canola.**

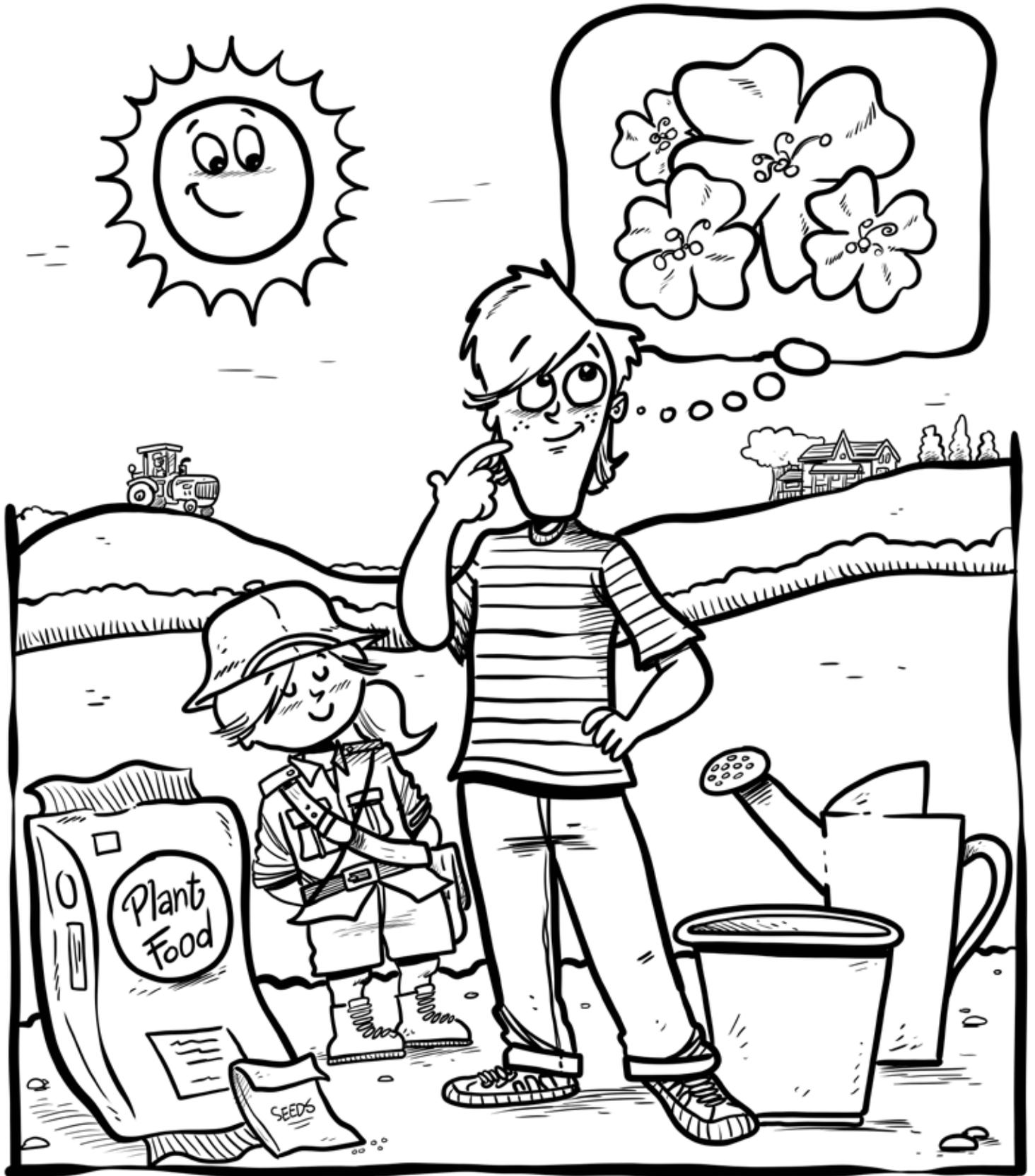
**Canola is one of the main crops Grandpa Duffy grows on the family farm.**



**Chase and Amelia also enjoy baking and cooking with their grandma.  
Together, they make special traditional family recipes  
using heart healthy canola oil**

**that comes from the canola seeds grown on the Duffy farm.**

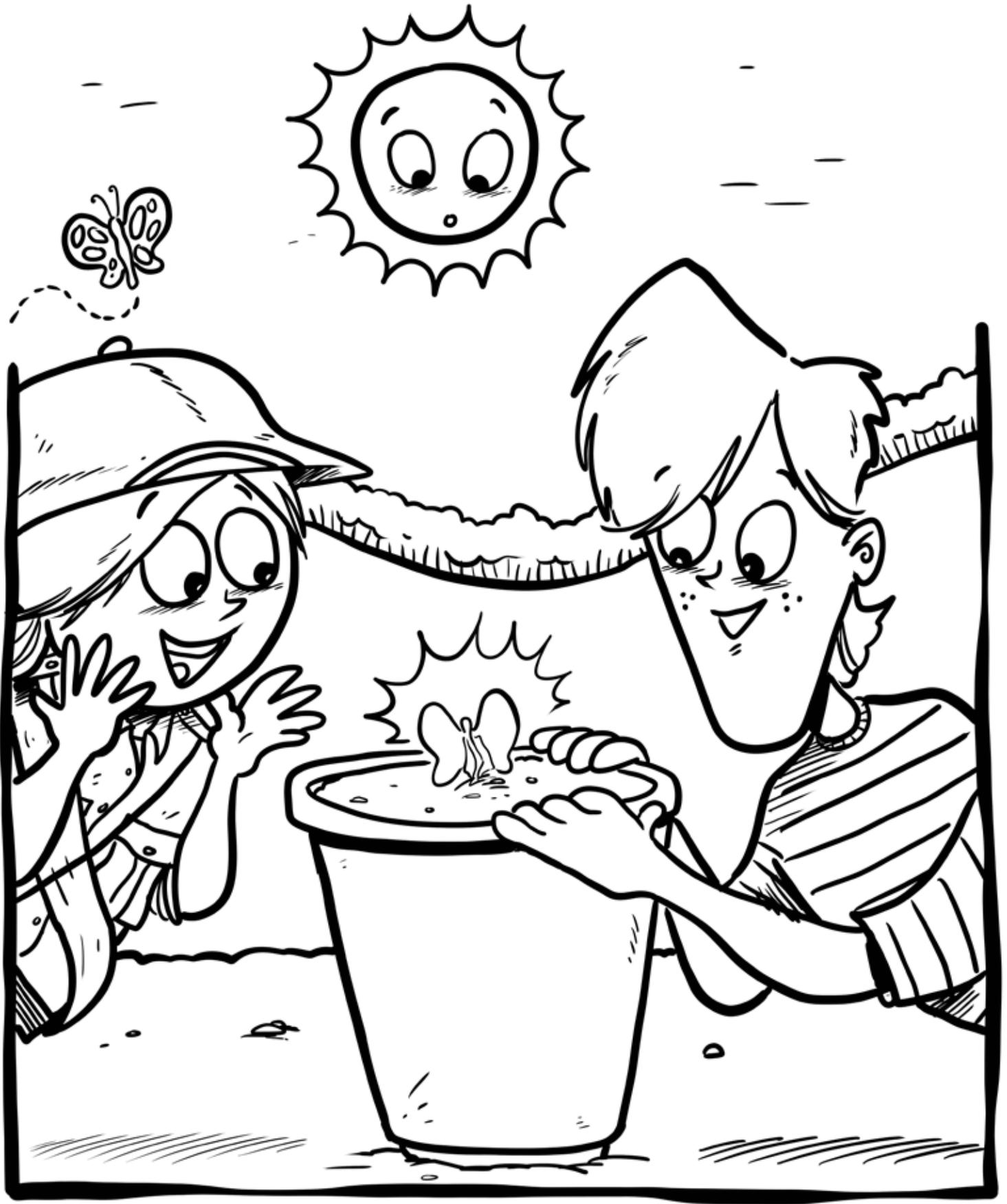
**Join Chase and Amelia in their many fun-filled adventures on the Duffy farm!**



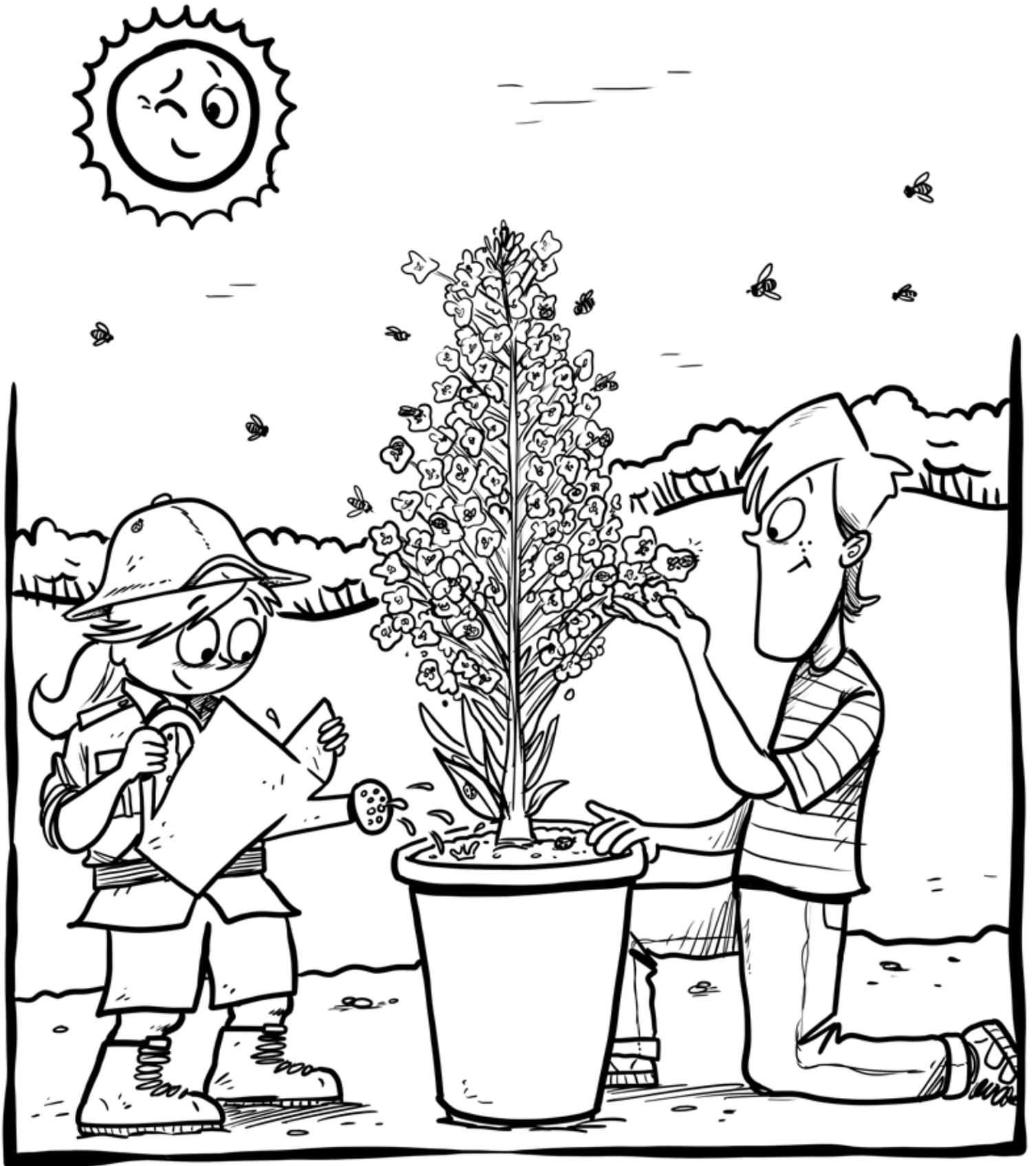
Chase and Amelia have learned so much about canola from Grandpa Duffy. In the springtime they were given some seeds by their grandpa, which they plan to grow in a pot with soil. You can also try growing your own seeds at home with the help of an adult. Seeds can be purchased from your local agriculture store.



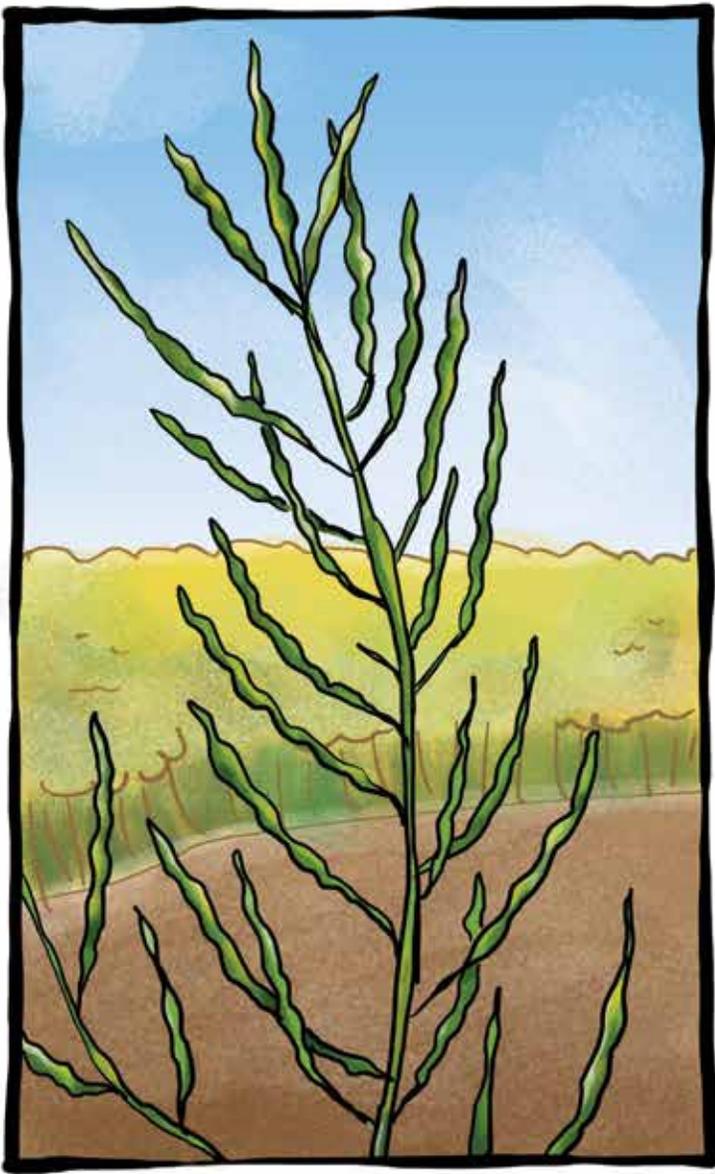
Chase fills the pot with soil and asks Grandpa Duffy to add some plant food, which is also called fertilizer. They then plant the seeds and cover them with soil. Amelia sprinkles the mixture with water.



Chase places the pot in the sun. They water it lightly every day.  
Soon little leaves appear.



Chase and Amelia watch the canola plant grow over the coming weeks. By summer they notice their canola plant becoming tall and see insects on the plant and some pollinating the tiny yellow flowers.



Once the flowers are pollinated, Chase and Amelia notice the flowers turn into green coloured pods. Later on, they notice green seeds growing inside the pods.





By fall, Chase and Amelia notice that the green pods turn golden yellow. The canola seeds inside turn a dark black-brownish color.



# IT'S YOUR TURN!

What you need...



1 small container of seeds



water



small clear disposable cup or container



soil to fill 2/3 of the container



disposable spoon

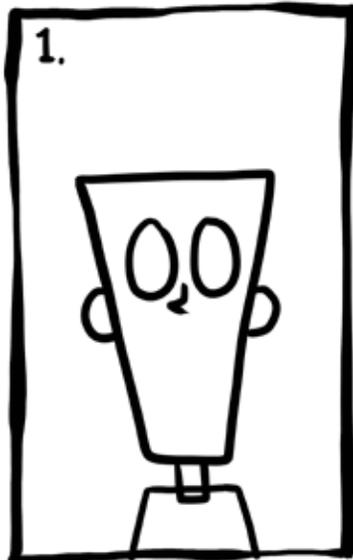
## Grow some plants in the classroom... here's how:

Note: Have an adult help you with the following steps.

1. Label your clear disposable cup or container with your name.
2. Using your disposable spoon, fill the cup 2/3 with soil.
3. Place 1-2 seeds about 2.5 cm apart in the soil and about 1.5 cm deep into the soil. Once seeds are in their holes, cover with soil.
4. Drip water on top of the seed and soil until the soil is damp, but not too wet.
5. Place the cup and seed in a room temperature area where it is safe and will be able to have access to sunlight.
6. Check the cup every day. Keep the soil damp.
7. Watch what happens!



# How To draw Chase Superman Duffy!



**Simple Shapes!**



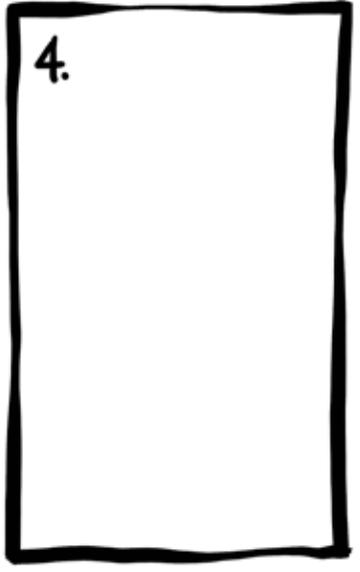
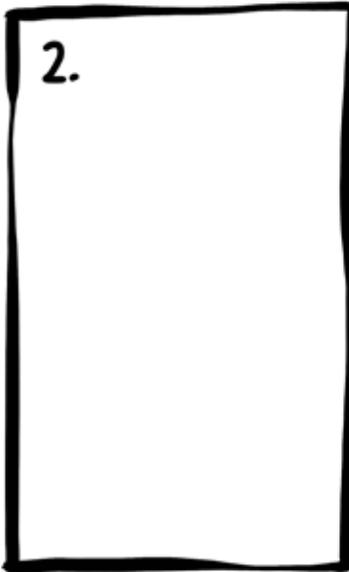
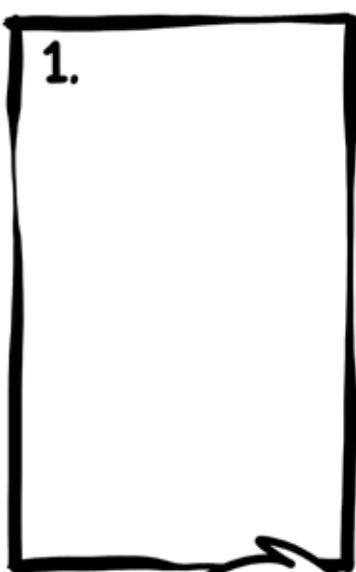
**Hair!**



**Nose and mouth!**



**Details!**



**Remember to  
always draw in pencil first,  
so you can erase guidelines  
and fix mistakes!**



**Help Chase  
Find All  
the Oil Drops  
to Learn  
What Canola is  
Used For!**



CANOLA SEEDS,  
OIL AND MEAL  
ARE USED  
AROUND THE WORLD!



CANOLA OIL  
CAN BE  
USED TO  
MAKE A LOT  
OF  
NON-FOOD  
ITEMS  
AS  
WELL!

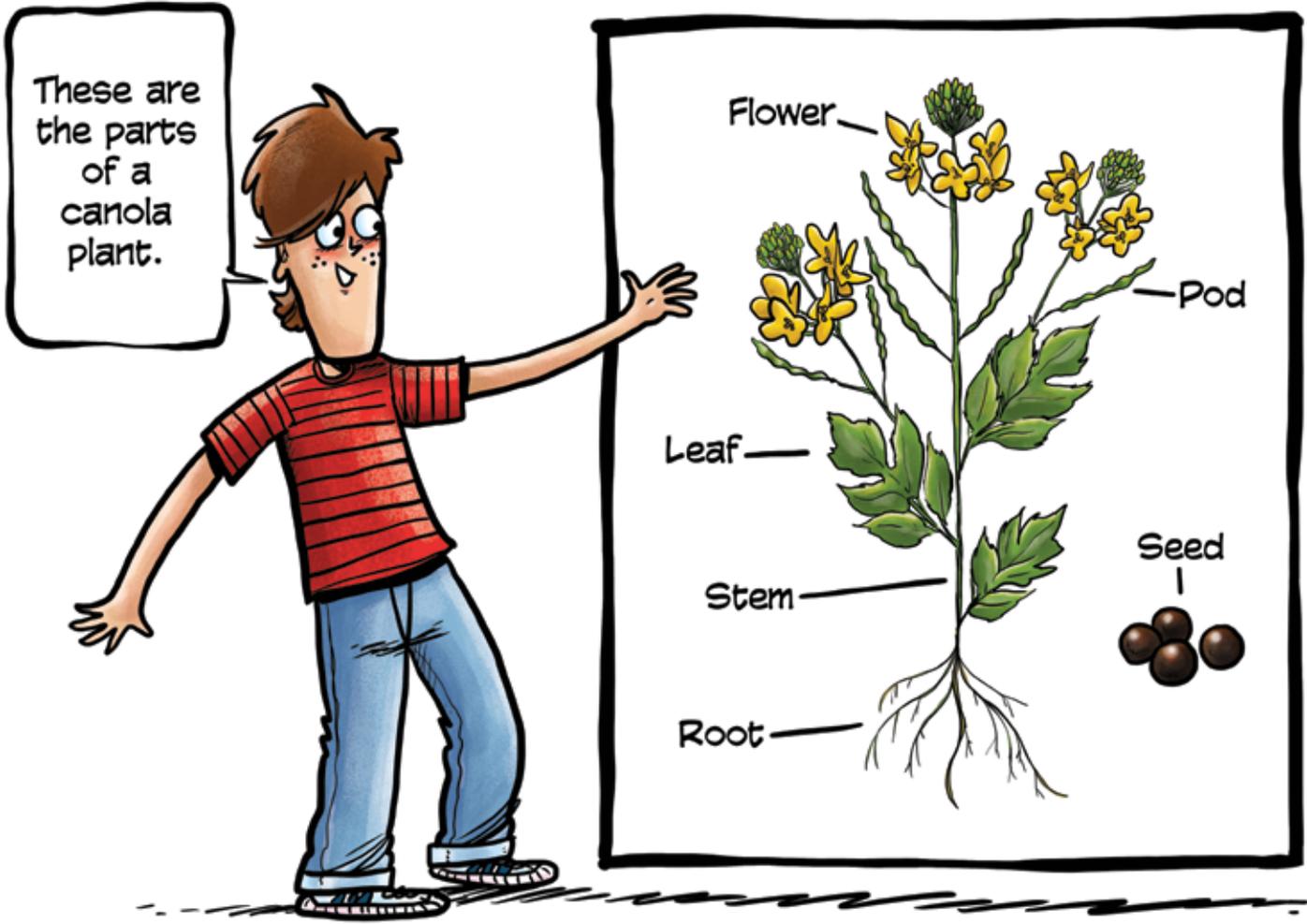


## It All Begins With The Seed!

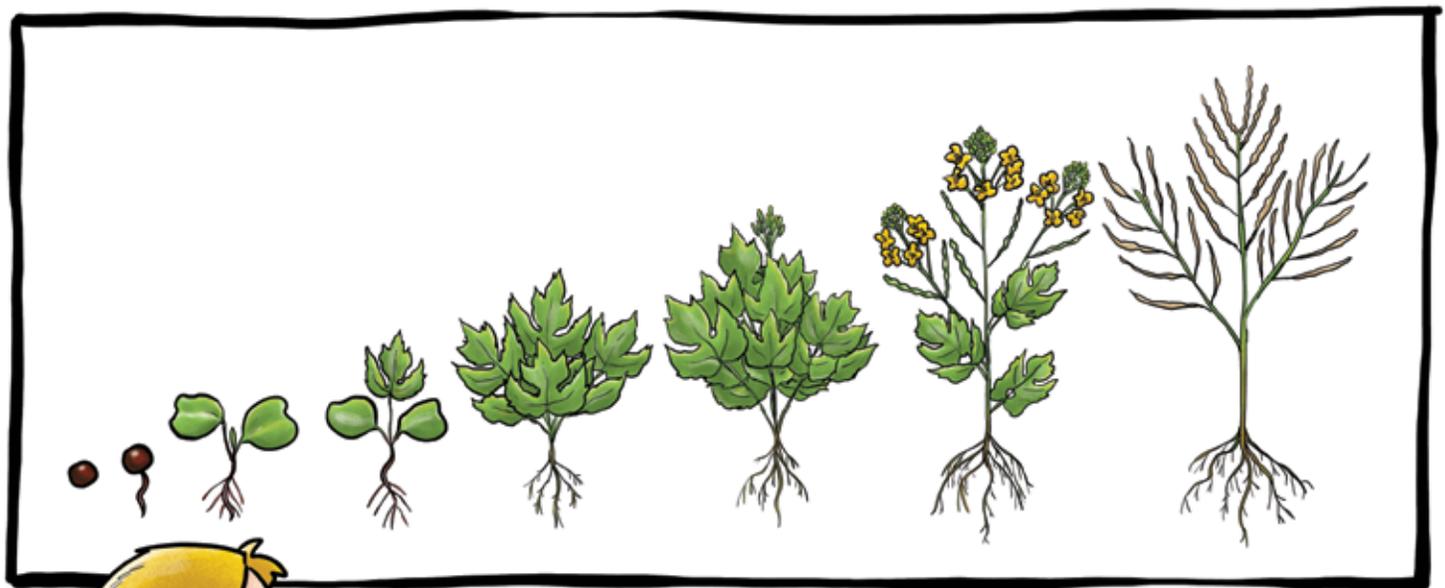


Answers  
can be  
found on  
page 14



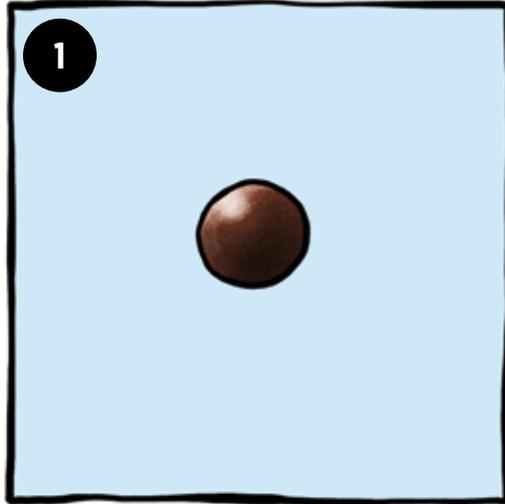


## It All Begins With The Seed: Canola Plant Life Cycle.

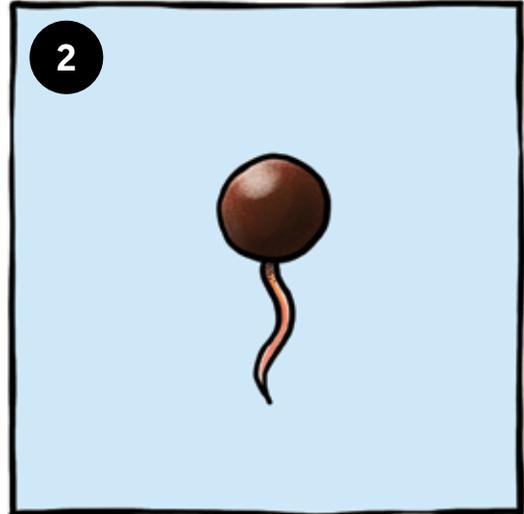


# It All Begins With The Seed: Canola Plant Life Cycle.

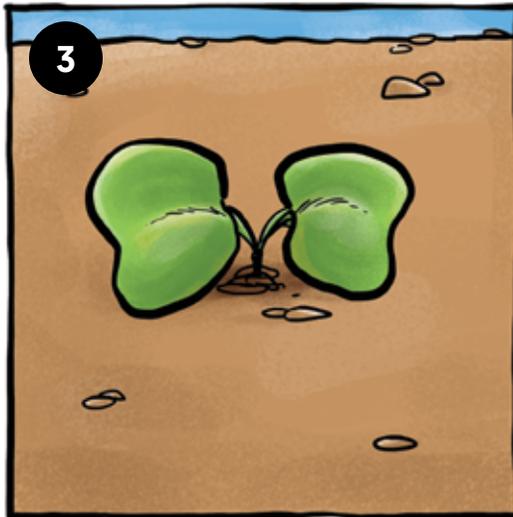
A canola plant comes from one single tiny dark coloured canola seed that measures approximately 1 millimetre in diameter!



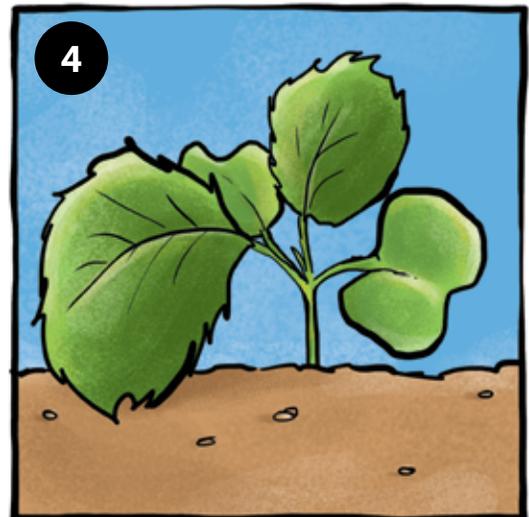
The canola seed is planted by special farming equipment called a seeder in the springtime.



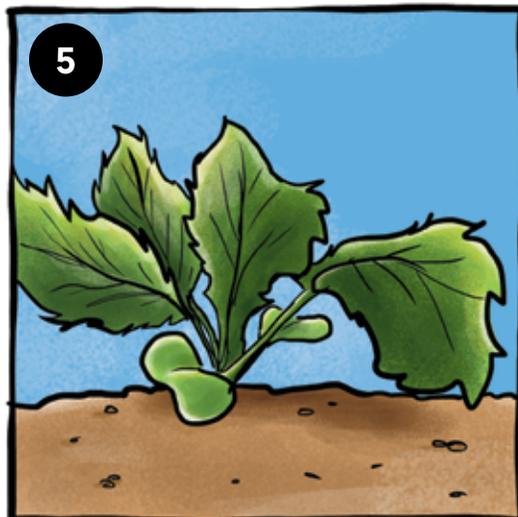
The canola seed will next germinate and begin to produce a root.



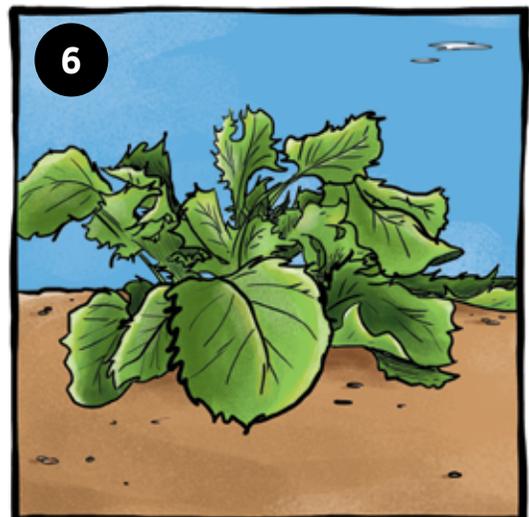
During emergence, you see a young canola plant peak through the soil. This young plant is a cotyledon.



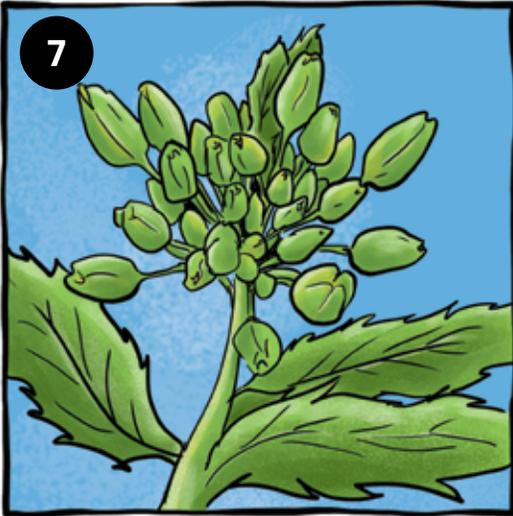
The cotyledon will develop 2 true leaves, in addition to the young cotyledon leaves.



The young canola plant will grow 4 leaves.



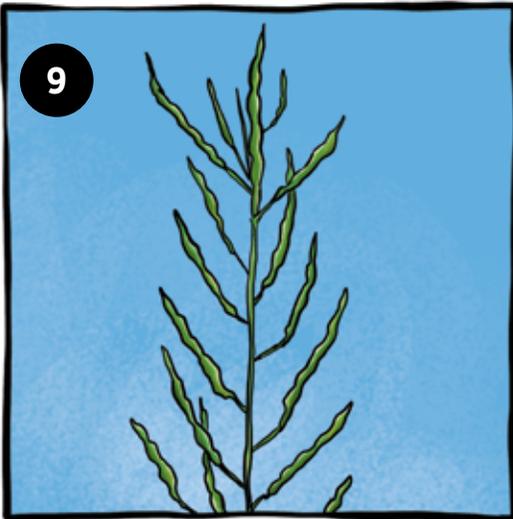
The young canola plant will enter the rosette stage.



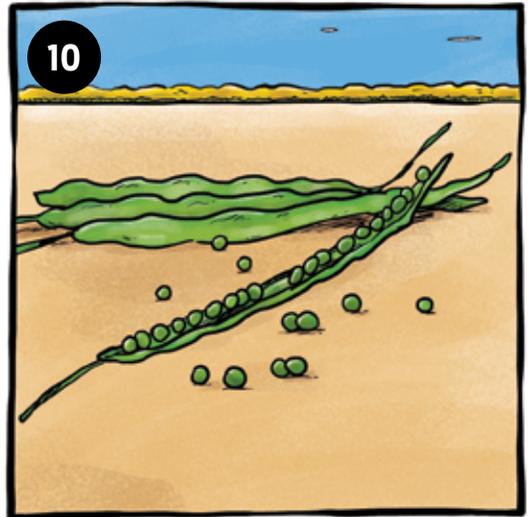
The young canola plant will enter the budding stage.



A canola plant grows to be about 1-2 metres in height and is a flowering plant. Insects, like bees will pollinate the flowers.



When flowers are pollinated, they will produce green pods.



Each plant will produce on average 60-100 pods that are about 5 centimetres long. Each pod will produce approximately 20-30 canola seeds.



Seed colour determines maturity and indicates when the canola crop is ready for harvest. A combine is used to get the dry canola seeds out of the golden yellow pods.

### Solution to the hidden oil drops from page 10-11

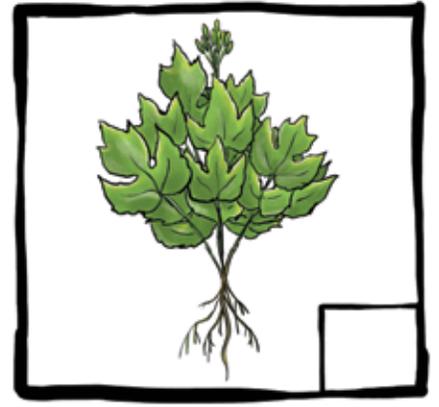
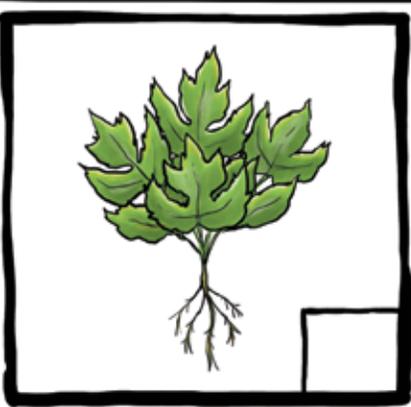
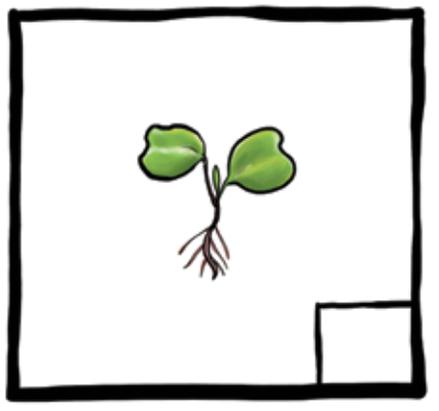
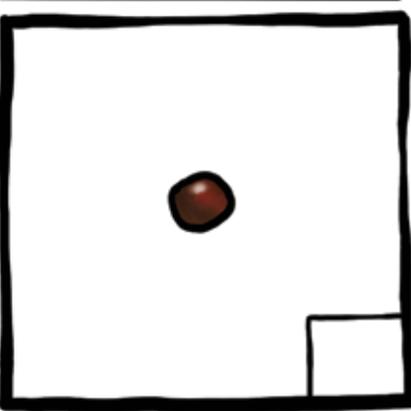
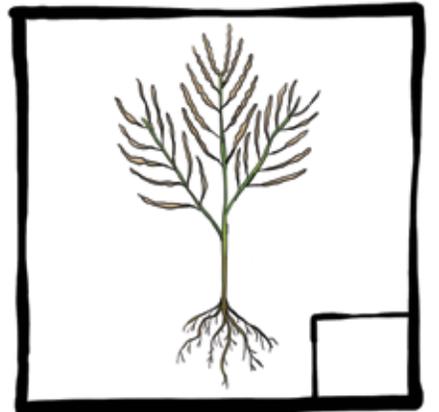
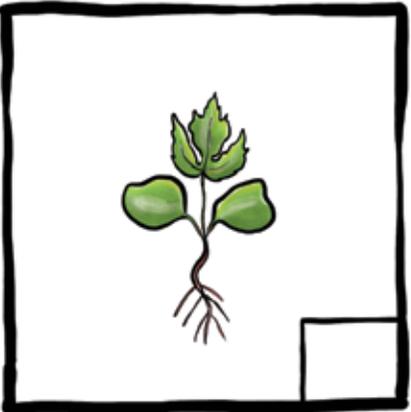
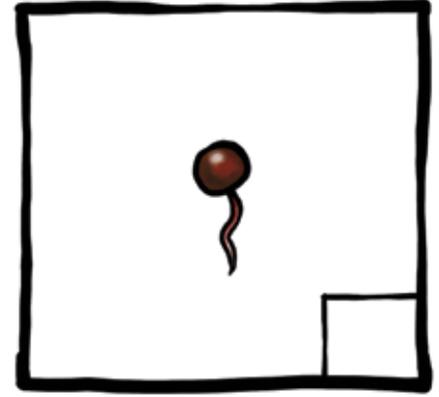
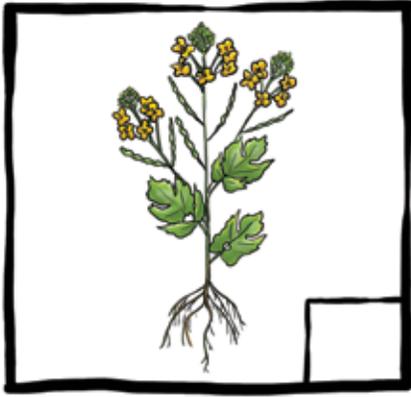
- o Plane - canola oil used in biofuel, plane de-icer and planes export canola seeds, oil, and meal all around the world.
- o Bird feeder - canola meal can be used in bird feed.
- o Truck - canola oil is used to make bio diesel and trucks transport canola seed, meal and oil.
- o Suntan lotion - canola oil is used to make suntan lotion.
- o Canola oil - canola is used in cooking, baking and various other products.
- o Lipstick - canola oil is used to make cosmetics.
- o Bunny - canola meal is part of pet food.
- o Bee - canola flowers give bees their source of food to make honey, and the bees help to pollinate canola flowers to produce canola seeds.
- o Cow - canola meal is used to make animal feed.
- o Cookies - canola oil is used for baking.
- o Insect repellent and lip gloss - canola oil is used in making cosmetics and things like bug spray.
- o Mushrooms - canola oil is used in cooking.
- o Newspaper - use canola oil to make ink.
- o Candle - use canola oil to produce wax in candles.
- o Canola field - canola seed is used to grow canola.

# OUT OF ORDER!

Oh no!  
We have forgotten  
all of the stages  
of canola growth!  
Can you help us  
put this mess  
back in order?



In the space provided  
on each image, record  
the number (in the  
little box) and write down  
the name (on the line  
below the image) of the  
canola growth stage  
that picture is  
showing.



# Hey Kids! Check Out These Other Great Fun Activities!

## Kindergarten: ●

- Let's Play: *What Do You See: How Many Canola Flowers, Ladybugs, and Bees?* ..... pg. 17
- Let's Play: *4 Seasons!* ..... pg. 18
- Cooking with Chase and Grandma Duffy: *Nuts N Bolts*..... pg. 19
- Chase's Crazy Canola Crafts: *Yellow Blooms and Mixed Medium Painting* ..... pg. 20-22

## Grade 1:

- Let's Play: *Doubles Aren't Trouble!*..... pg. 23
- Let's Play: *Find the Field - Colour by Number*..... pg. 24
- Cooking with Chase and Grandma Duffy: *Bannock* ..... pg. 25
- Chase's Crazy Canola Crafts and Science Experiments:  
*Fizzy Chaos, Berry Playdough and Juicy Gel Squish!* ..... pg. 26-28

## Grade 2:

- Let's Play: *Connect Four - Addition!* ..... pg. 29
- CANowledge Time: *The Good, the Bug, and the Canola!*..... pg. 30
- What Helps and Harms a Canola Plant? ..... pg. 31
- How Much Water to Grow a Bee-you-tiful Golden Flower? ..... pg.32-33
- Let's Play: *Elimination!* ..... pg. 34-35
- Cooking with Chase and Grandma Duffy: *Monster Cookies*..... pg. 36
- Chase's Crazy Canola Crafts and Science Experiments:  
*Light It Up, Upside Down PLOP, Show What You Know!* ..... pg. 37-39
- Canola Breakout! ..... pg. 40

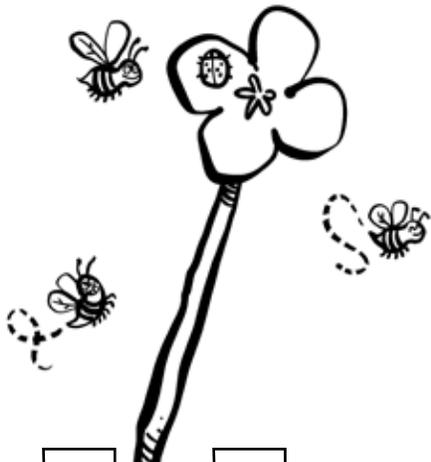
## Grade 3:

- Let's Play: *One-Metre Canola Dash Madness, Back-To-Back, The Quickest Chef, Area and Perimeter of a Canola Field*..... pg. 41-48
- Cooking with Chase and Grandma Duffy: *Did Someone Say Pizza?* ..... pg. 49
- The Journey of the Canola Seed: *From Grain Bin to Bottle!* ..... pg. 50-52
- Uh-Oh! Help Grandpa Duffy Get his Canola Seed Through the Crushing Plant Maze! ..... pg. 53
- Chase's Crazy Canola Crafts and Science Experiments:  
*Stained Glass and the Ultimate Brain-Build-A-Thon Challenge:*  
*Drive In, Eggs Away, London Bridge Isn't Falling Down!* ..... pg. 54-59
- Canola Craze..... pg. 60-61

# Let's Play - What Do You See: How Many Canola Flowers, Ladybugs, and Bees?

**How many canola flowers, ladybugs and bees do you see?**

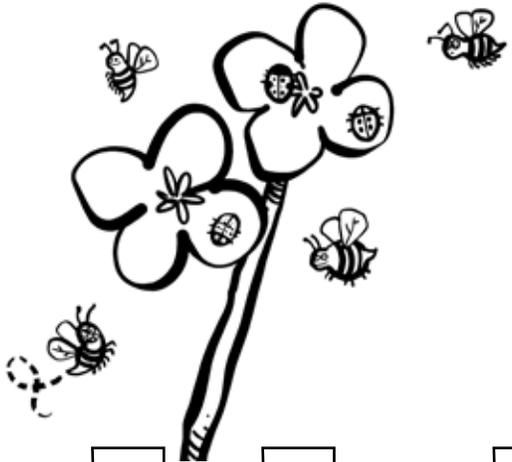
Colour all canola flowers **yellow**, the ladybugs **red**, and the bees **yellow**. Record your number in the **answer box** below the canola plant for each plant shown.



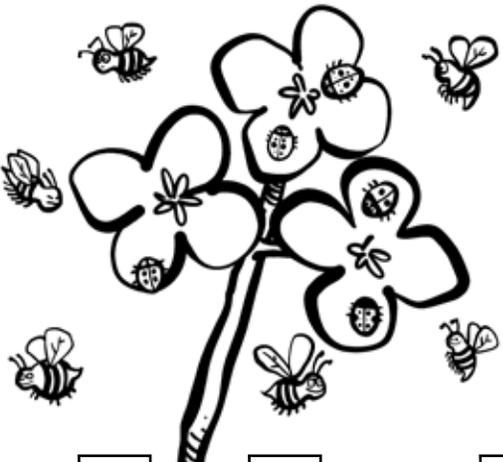
Canola Flowers  Bees  Ladybugs



Canola Flowers  Bees  Ladybugs



Canola Flowers  Bees  Ladybugs



Canola Flowers  Bees  Ladybugs



Canola Flowers  Bees  Ladybugs

# Let's Play - 4 Seasons!

Many things in life are connected to the seasons, including canola growth. We seed canola in the spring, canola grows throughout the summer, and canola seeds are harvested in the fall. Plants cannot grow during the winter when the ground is covered with snow. At this time, the farmer is working hard to plan ahead for their next growing season.

We will play 4 Seasons to help you think about what is happening with canola during the different seasons.

## Materials:

Class of students, and one big area where students can run.

## Objective of the game:

To eventually tag all students and have all students in the middle with the "It" person.

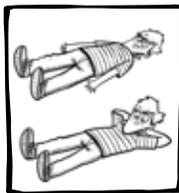
## How to Play:

4 seasons is played like 4 corners!

1. One person stands in the middle, closes their eyes and counts to 10.
2. During the 10 seconds players who are not "it", can run to any of the 4 corners that the adult has assigned ahead of time to one of the 4 seasons: winter, spring, summer or fall.
3. After 10 seconds the person in the middle calls out a season (e.g. "fall"), and opens their eyes.
4. All people in the called for corner will join the "it" person in the middle. The people in the other corners all must act out what canola may be doing during that season during their assigned corner's season.
5. The person in the middle then counts out another 10 seconds and all the people that are in the centre with them can try to tag a friend. The person in the middle then repeats the activity until all players are in the centre.

## Canola Actions for the Game [Note to participants: feel free to be as creative as you would like!]:

- **Winter:** Canola seeds would be resting in the grain bin. Have children on their stomachs or back laying down on the floor to exemplify canola seeds resting in the grain bin.



- **Spring:** Canola would be seeded and starting to emerge. Have kids kneeling or doing a squat position while holding their hands above their head to represent emergence.



- **Summer:** Canola is growing big and tall. Have kids standing up super tall, raising their arms above their heads, spreading their fingers wide to show canola flowering. This demonstrates the height of the canola plant and the canola plant flowering.



- **Fall:** Canola seed pods would be harvested. Have kids roll their hands and forearms over each other in front of their bodies to represent combines harvesting the canola seeds from the canola pods.



# Cooking with Chase and Grandma Duffy

## Nuts N Bolts <sup>1</sup>

Being healthy means caring for your body so that you have energy to learn, play, and grow. Eating healthy snacks can help you get enough energy, keep your tummy from growling, and meet your daily nutrition needs.

Grandma Duffy knows that sometimes after all the playing and learning Chase and Amelia do around the farm, Chase and Amelia might have a healthy snack attack! With the help of an adult, try making some Nuts N Bolts to crunch on.

**Yield: 44 cups**

### Ingredients

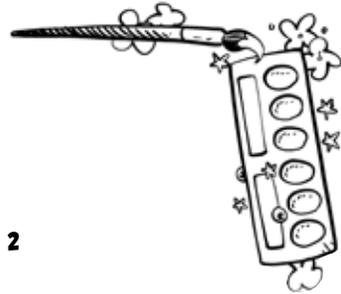
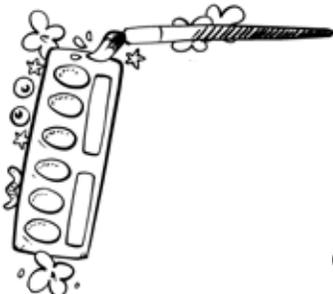
- 6 cups Rice Squares [1.5 L]
- 6 cups Multigrain O's [1.5 L]
- 5 cups Wheat Squares [1.25 L]
- 6 cups Crispy Hexagons [1.5 L]
- 5 cups Corn Squares [1.25 L]
- 1 - 200 g package pretzel sticks [about 3 ½ cups] [875 mL]
- 1 - 1.13 kg jar salted mixed nuts or peanuts
- 1 cup canola oil [250 mL]
- ¼ cup Worcestershire sauce [60 mL]
- 1 Tbsp seasoning salt [15 mL]
- 1 Tbsp celery seed [15 mL]
- 2 tsp garlic powder [10 mL]
- 1 tsp onion powder [5 mL]
- ½ - 1 tsp cayenne pepper [2-5 mL]
- Large roasting pan, and depending on the size of your roasting pan, 2 roasting pans.

### Instructions

1. Preheat oven to 200°F [100°C]
2. In a large roasting pan or aluminum pan, combine cereals, pretzels and nuts.
3. In a small bowl, whisk together remaining ingredients. Drizzle mixture over cereal mixture, stirring constantly; toss to coat. Stir cereal and oil mixture 3 or 4 times as you drizzle.
4. Bake for about 1 hour, stirring every 15 minutes, until dry and crispy.
5. Let the mixture cool. Serve or store the mixture in an air-tight container.
6. Clean up.
7. **Note:** You may need to divide the mix into two batches to bake depending on the size of your roasting pan. Additionally, this recipe can be halved. Cayenne pepper is also optional.

*See reference section for an additional great helpful tips! <sup>1a</sup>*





# Chase's Crazy Canola Crafts

## Yellow Blooms

### (and Mixed Medium Painting) <sup>2</sup>

We have learned a lot about canola so far! Let's share some of our CANowledge with others by making this fun filled craft with the help of an adult!

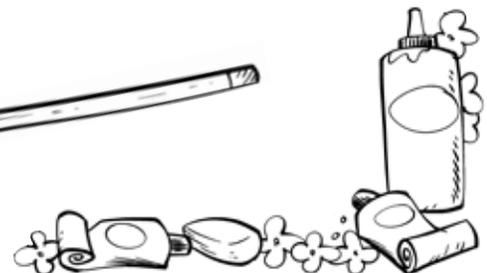


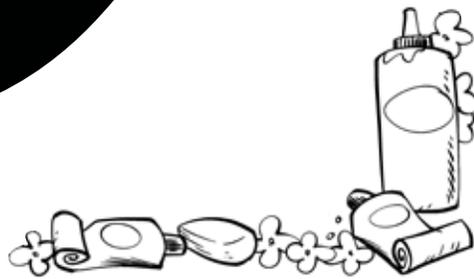
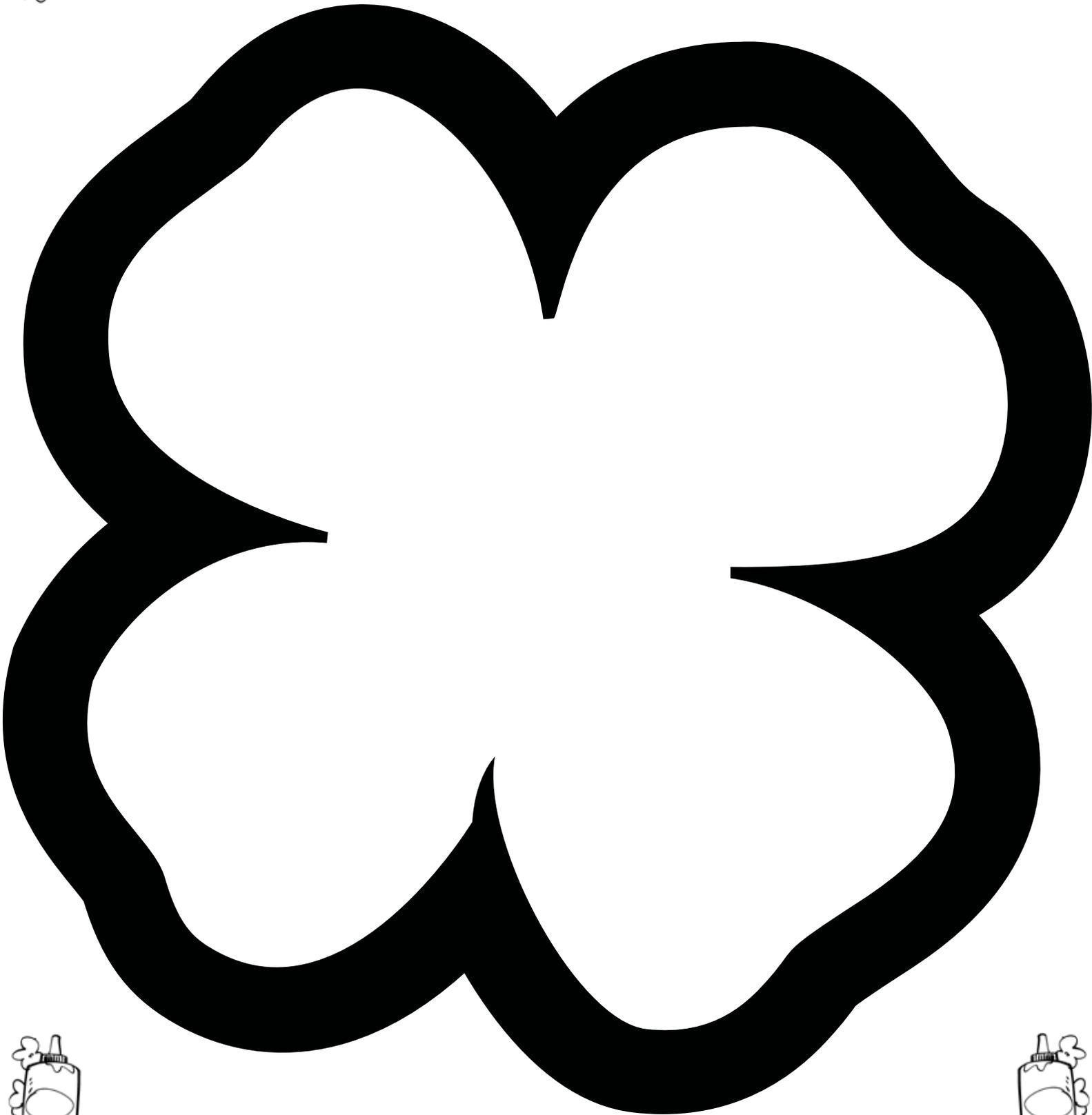
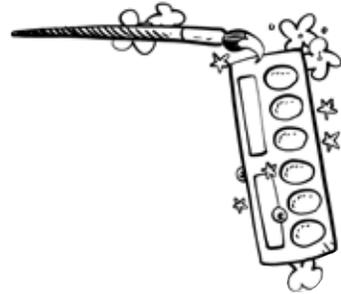
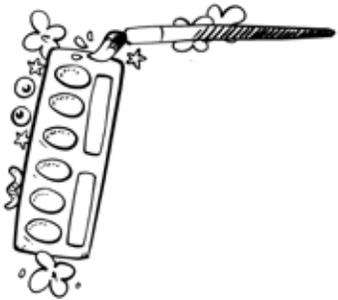
**Materials needed:**

- Scissors
- Pencil
- Eraser
- Old mixing containers for paint and water [2-5 depending on how many colours you make]
- Enough paintbrushes for all of the colors you choose to use
- Material to protect painting surface [e.g., old newspapers or garbage bags]
- Cut out of canola flower on page 21
- Permanent dark coloured marker
- Additional canola flower decorations you might like to use
- 6 various unwrapped wax crayons of any colour and brand you want to use
- **[Note: Bright colors will work best]**
- ½ cup [125 mL] of canola oil
- Muffin pan
- Cupcake paper liners
- Toothpicks or stir sticks for mixing
- Optional: 4 tsp of glitter of your choice [20 mL]

**Directions:**

1. Prepare area and yourself to paint. Cover any surface that you do not want to get paint on with protective material. Wear appropriate clothing.
2. Print out 1 to 4 fun facts you learned about canola onto each petal of the flower found on page 21 with your pencil. Trace over in permanent marker.
3. With an adult helper, follow the directions on page 22, Mixed Medium Painting, to mix paint and paint your canola flower!
4. Using scissors, cut out the canola flower on page 21-22.
5. Clean up!





# Mixed Medium Painting <sup>2</sup>

Use the materials on page 20.

## Instructions:

1. Preheat oven to 200°F [100°C].
2. Line a muffin pan with double baking cups and line 6 of the muffin cups in the pan.
3. Break unwrapped wax crayons into smaller pieces and place one crayon in each baking cup.
4. Place muffin pan into the oven for 8-10 minutes or until crayons are melted in baking cups. Ask an adult for help to remove the pan from the oven as melted wax can cause serious skin burns.
5. Working quickly with 1 colour at a time, add 1 tsp [5 mL] of canola oil to one baking cup. Stir the mixture with a toothpick until the canola oil completely disappears into the hot melted crayon. Add another 1 tsp [5 mL] of canola oil to the baking cup. Stir until the canola oil is completely absorbed.
6. Repeat step 5 until each crayon colour has 2 tsp [10 mL] of canola oil added. Cool.
7. \*If using glitter, add ¼ tsp [1 mL] to each of the melted wax-canola oil mixtures.\*
8. Paint the cut-out canola flower and let dry.
9. Clean up.
10. Once the canola flower is dry, display your canola flower on the fridge for everyone to see!

# Let's Play - Doubles Aren't Trouble

From one canola seed we can get many more! Let's practice our adding!

In Doubles Aren't Trouble, roll one die and double your answer to see how many possible canola plants will grow from one seed!

## Objective of the game:

To have the student get the first straight or diagonal row filled in on their gameboard.

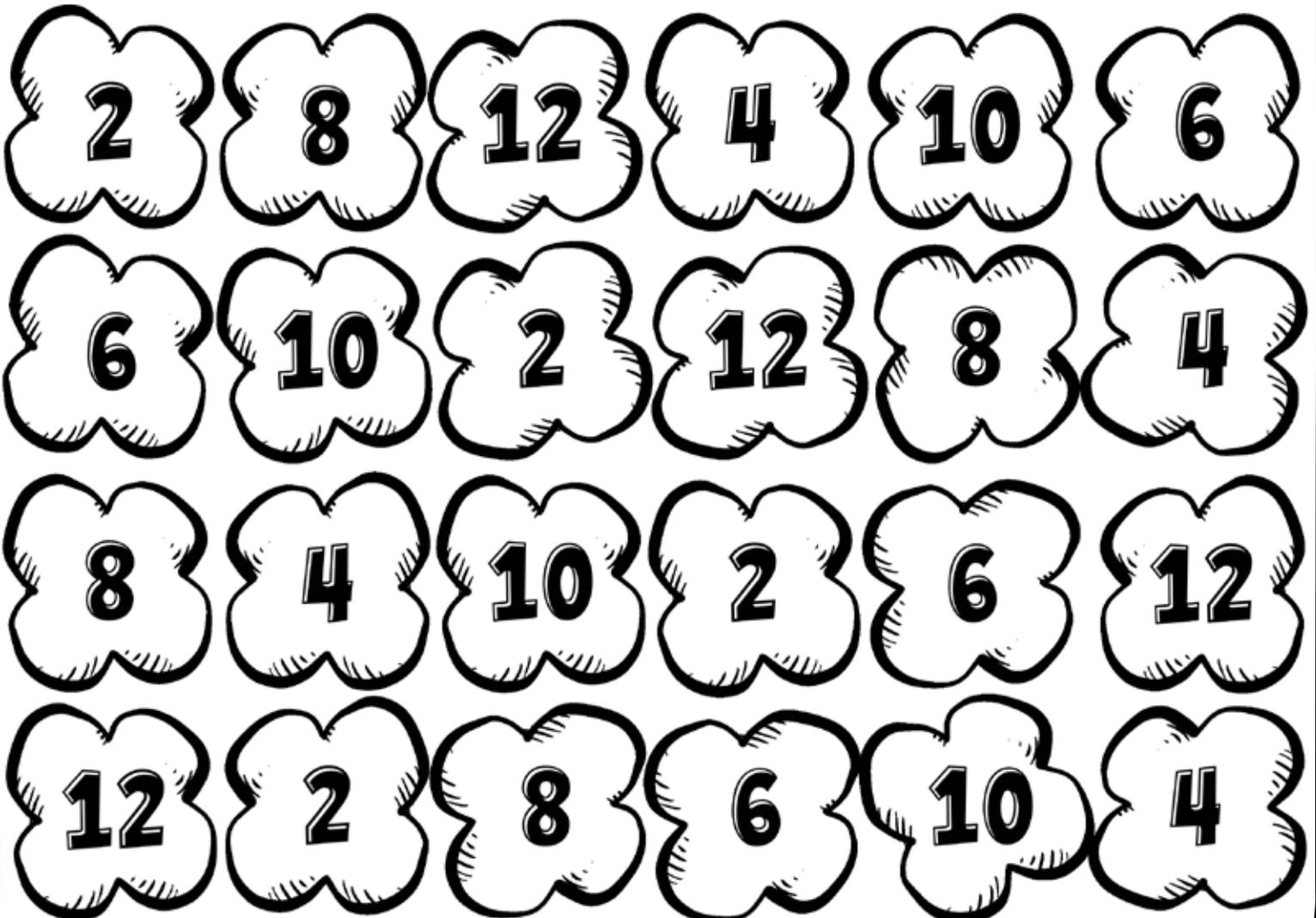
## Number of players: 2

## Materials Needed to Play:

- 1, 6-sided die
- 1 game board per player
- A yellow marker

## How to Play:

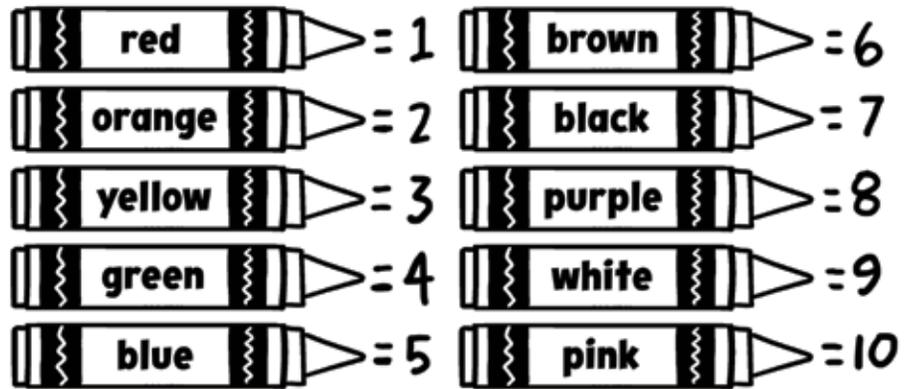
1. Roll one die and double your answer.
2. Colour in the canola flower on your answer sheet that matches the number you determined by doubling your roll.
3. Challenge a friend to see who gets the first straight row or diagonal row.
4. Ultimate challenge! Challenge a friend to see who can fill in all of the flowers first



# Let's Play

Find the Field:

# Colour by Number



# Cooking with Chase and Grandma Duffy

## Bannock! <sup>3</sup>

Eating a variety of foods is not only delicious but is the key to a healthy and balanced diet. Have plenty of vegetables and fruits and split the other half of your plate, bowl, or lunch box with whole grains and protein foods. Choose protein foods from plants more often (Alberta Health Services).

Here is a fun filled First Nations, Inuit, and Métis inspired recipe that can be cooked by anyone.

Chase and Gandma Duffy love to make bannock to eat with a bowl of stew on a chilly day. Chase also loves to eat this with margarine and his grandma Duffy's famous homemade raspberry jam. Remember to have an adult help you with this recipe!

**Yield: 8 servings**

### Ingredients:

- 2  $\frac{1}{3}$  cups whole wheat flour [575 mL]
- 1 tsp baking powder [5 mL]
- $\frac{1}{2}$  tsp salt [2 mL]
- $\frac{1}{4}$  cup soft [non-hydrogenated] margarine [60 mL]
- $\frac{1}{4}$  cup 1% milk [60 ml]
- $\frac{3}{4}$  cup water [175 mL]



### Instructions:

1. Preheat oven to 375°F [190°C].
2. Lightly spray the baking sheet or baking dish with non-stick cooking spray. Set aside.
3. In a large bowl, mix 2 cups [500 mL] of flour, baking powder and salt with a spoon.
4. With the tips of your fingers, work margarine into flour mixture until margarine is divided into small [pea size] pieces.
5. Make a well in the centre of the flour mixture; pour milk and water into the well.
6. Starting at the centre of flour mixture, gradually mix flour into liquid until a soft dough forms. Add remaining flour if needed to get mixture to form a soft non-sticky dough.
7. **[Note:** If you have remaining flour from making the dough, use this to flour your surface.] Turn dough onto lightly floured surface, knead dough a few times, cover and let it rest for at least 20 minutes.
8. Place dough on prepared baking sheet or dish. Flatten dough and shape it into a rectangle.
9. Bake at 375°F [190°C] for approximately 30-40 minutes or until golden.
10. Cut bannock into pieces, about 2 inches X 2 inches [5 cm X 5 cm].
11. Clean up.
12. Serve with soup or stew. Bannock also tastes great with peanut butter and jam!

[Used with permission from Alberta Health Services, Nutrition Services, copyright 2019]



# Chase's Crazy Canola Crafts and Science Experiments!

## Fizzy Chaos! <sup>4</sup>

Amelia Duffy is curious and would like you to help her find out what might happen when vinegar and baking soda are mixed together. This activity will leave you with a fizzy-good-time. Make sure to work with an adult to help where necessary.

### Materials:

- Medium - large sized mixing bowl
- 1 cup flour [250 mL]
- 1 cup baking soda [250 mL]
- ¼ cup canola oil [60 mL]
- Food colouring - oil based, or 1 tsp of non-water based, powdered food colouring
- Vinegar
- Spray bottle
- Spoon
- Whisk [optional]
- Moulds or cookie cutters [optional]

### Instructions:

1. Make a **prediction** [a best guess] about what might happen when baking soda and vinegar are mixed together. Ask your teacher or adult for examples of when they might mix vinegar and baking soda together in the kitchen.
2. Mix the flour and baking soda in a bowl - it is safe to use your hands!
3. Measure a half cup of vegetable oil in a liquid measuring cup. Add a couple drops of food colouring or 1 teaspoon of powdered, food colouring to the oil. Mix with a spoon or whisk.  
**Note:** the colour will appear a lot darker in the oil than the final colour when mixing with the dry ingredients.
4. Carefully, add the coloured oil to the bowl. Use a large spoon to mix the ingredients.  
**Note:** the food colouring may leave temporary stains on your hands, so use a mixing tool to avoid unwanted colour on your hands.
5. Play with the dough to form shapes or a scene involving canola flowers! If you like, use cookie cutters or moulds to help get you started.
6. Fill a spray bottle with vinegar. Spray the dough gently and watch how the vinegar reacts to form fizz!
7. Was your prediction correct? Yes or no? Can you think of any other questions you might have to test from this experiment that may help Amelia in the future?
8. Clean up.



# Chase's Crazy Canola Crafts and Science Experiments!

## Berry Playdough! <sup>5</sup>

Did you know, you can create something magical with berries you may find on a nature walk?

### Materials for Berry Dye and Berry Playdough:

- 2 cups plain flour [500 mL]
  - 1 cup salt [250 mL]
  - 2 tbsp cream of tartar [30 mL]
  - 2 tbsp canola oil [30 mL]
  - 1½ cup berry dye [375 mL]
- Note:** see below for instructions on berry dye.
- Approximately 2500 g of frozen berries or about 3-4 cups of fresh berries for berry dye
  - ½ cup water [125 mL]
  - Fairy stones [stones from outdoors]
  - Googly eyes
  - Pipe cleaners
  - Sparkles
  - Large pot



### Instructions for Berry Dye:

1. Gather your berries. Collect enough to fill half a large pot.
2. Add enough water to just cover the berries.
3. Simmer the berries over low heat for approximately 1 - 1 ½ hours. Stir and check the berries approximately every 15-20 minutes. Leave the lid off of the pot so the berries cook down.
4. Strain the juice from the berries roughly 4 times. You can strain once with a cheese cloth as well to remove the pulp and let cool. The juice will yield approximately 4 cups.

### Instructions for Berry Playdough:

1. In a large saucepan combine flour, salt, cream of tartar, and vegetable oil.
2. Add 1½ cups of the berry dye and ½ a cup of water for a strong colour. For a weaker colour use 1 cup of dye and 1 cup of water.
3. Stir over medium heat until the mixture begins to form a ball, approximately 3-5 minutes.
4. Remove the mixture from the heat and knead until the dough is smooth.
5. To prevent any staining, use a plastic tablecloth or placemat when playing and shaping the dough.
6. Decorate with whatever materials you have available such as pipe cleaners, googly eyes. Have fun!
7. Clean up.

# Chase's Crazy Canola Crafts and Science Experiments!

## Juicy Gel Squish! <sup>6</sup>

When Chase eats certain candies, he notices some look a lot different than how they actually feel. Have you ever experienced this before? Try making these tasty agar juicy gel bubbles!

### Materials:

- 1½ cups canola oil (375mL)
- Tall glass container
- 1 cup colourful fruit juice or sports drink (250 mL)
- 1 tsp agar powder (5 mL)
- 2 cup (500 mL) liquid measuring cup or glass beaker
- 1 pipette or eye dropper
- Optional: larger pipette or turkey baster will allow for bigger drops
- 1 colander or fine mesh strainer

### Instructions

1. Make a **prediction** (best guess) on whether you think these candies will be squishy or not by looking at the materials. What might make the candies squishy?
2. Gather your materials.
3. With adult help, pour the oil into the jar or beaker and place the beaker in the freezer until the oil is really cold (at least 30 minutes).
4. Pour the fruit juice into a small pot and stir in the agar powder.
5. With an adult, place the pot over medium heat. Cook, stirring constantly, until the powder dissolves and the mixture just begins to boil.
6. Remove the pot from the heat. Pour the fruit juice and agar mixture into a bowl. Let the mixture cool to room temperature for at least 20 minutes.
7. Remove the glass of oil from the freezer. (If the glass of oil is cloudy, let it sit at room temperature until the cloudiness clears.) Fill the medicine dropper with the juice mixture. Hold the medicine dropper with the fruit mixture about an inch above the surface of the oil in the glass. Squirt a small amount of the juice mixture from the medicine dropper into the oil. As soon as the juice hits the oil in the glass, the mixture should form a little-ball-shaped-mass that will sink to the bottom of the glass. Continue until you have created about 20 beads (do not crowd the beads at the bottom, or they will smash).
8. Set a colander inside the bowl. Slowly pour the mixture of beads and oil into the colander to capture the beads. The separated oil can be reused for additional beads (though you may have to chill it again after a few batches).
9. Using a clean spoon. Spoon the beads onto the top of ice cream in a dish, or straight into your mouth and enjoy!
10. Give a conclusion, which means explain if your prediction was right, explain what happened and what might have caused the candies to be squishy or not.
11. Clean up.

**Teachers and adults:** check out additional references for a special note on this experiment! <sup>6a</sup>



# Let's Play - Connect Four: Addition

**From one canola seed we can get many more!**

Let's practice our adding! In Connect Four: Addition, we will see how many possible canola plants will grow from one seed!

**Objective of the game:** For the student to have the first straight or diagonal row filled in on their gameboards.

**Materials:**

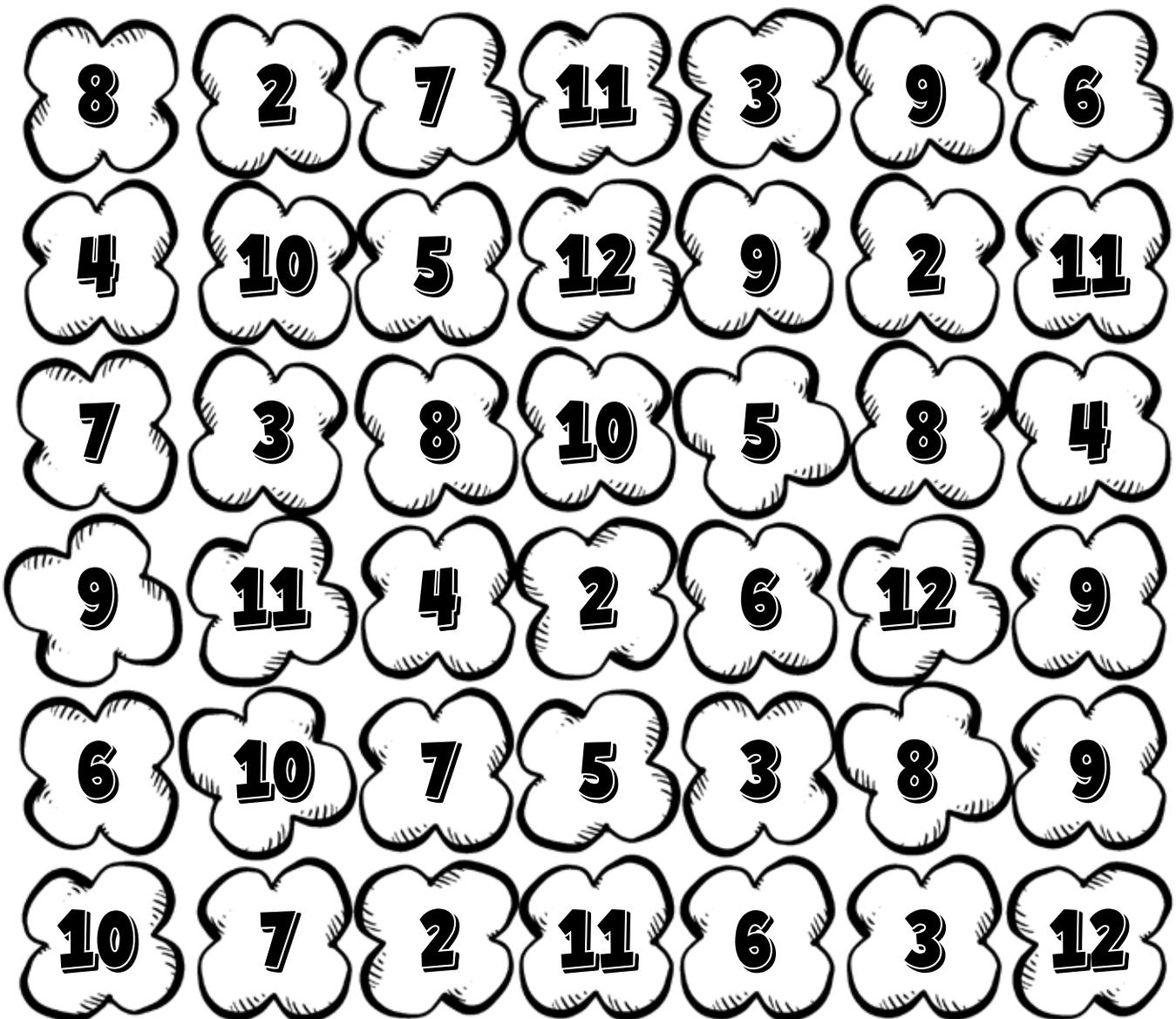
- 2, 6-sided dice
- A game board for each student
- A yellow marker

**Number of players:** 2

**Getting ready to play:**

**How to Play:**

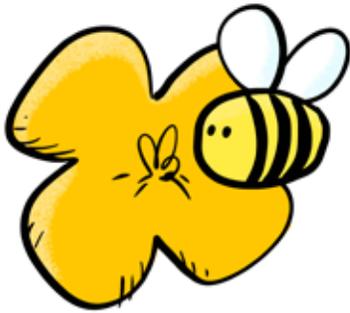
1. Roll both dice and add the two numbers for your answer.
2. Colour in your canola flower on your answer sheet that matches the answer on your die.
1. Each student will need their own game board and marker or something to cover up their gameboard.
2. The players will need 2, 6-sided dice.
3. Challenge a friend to see who gets the first straight row or diagonal row.
4. Challenge a friend to see who can fill in all of the flowers first!



# CANowledge Time

## The Good, The Bug, and The Canola!

Like humans, canola plants need water, nutrients (which can be found in soil from broken down and decomposed plant life in the soil, or come from fertilizer) and sunlight, to grow and become healthy and strong. Canola plants also depend on insects for growth. Insects that help the canola plant grow big and produce many canola seeds are called **beneficial insects**.



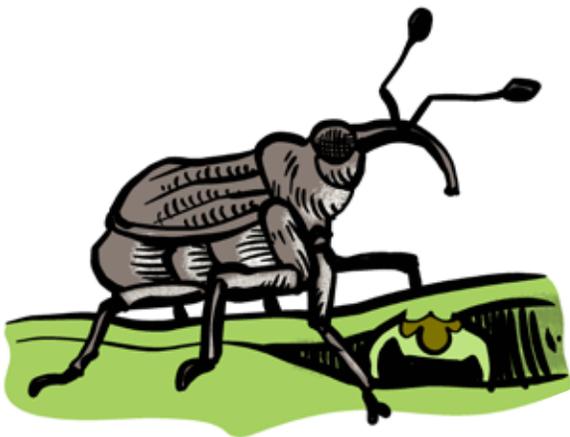
For example, honey bees pollinate the canola flowers, which help the canola plant produce pods.

---

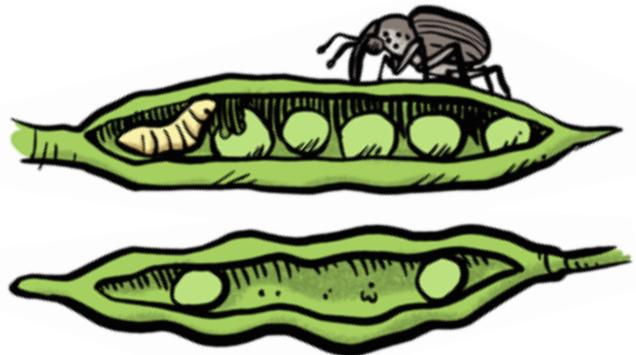
Inside canola pods is where we find the canola seeds.



Some insects are harmful to canola plants.



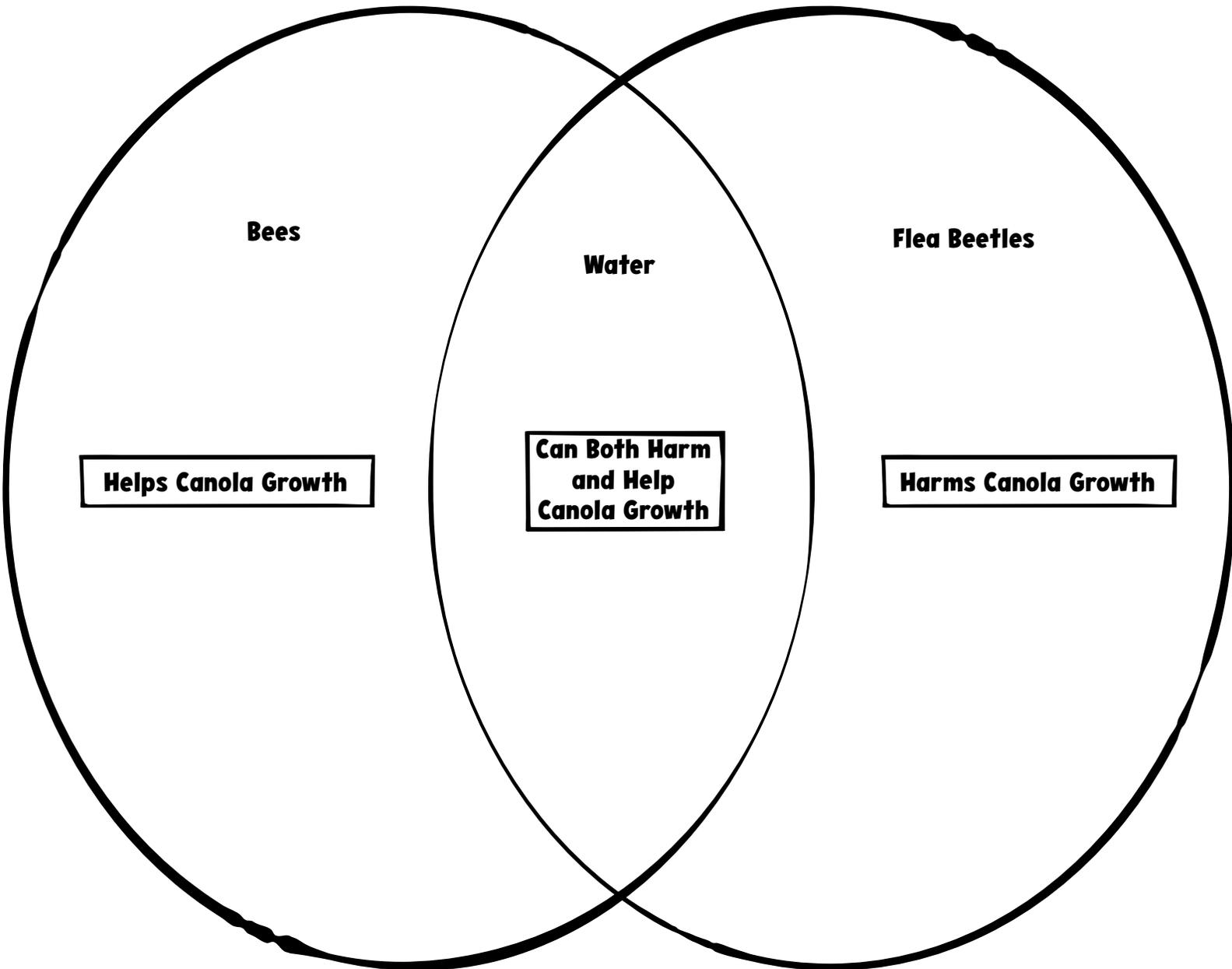
For example, cabbage seedpod weevils will bite through the pod wall, and lay their eggs inside the canola pods. When larvae hatch from the eggs, the larvae will eat the seeds inside the pods to grow and develop. During budding and early flowering stages, the adults will feed on the pollen, nectar and buds.



Flea beetles eat new canola seedling leaves, which affects the growth of the plant.



# What Helps and Harms a Canola Plant?



Amelia and Chase are learning from Grandpa Duffy that there is a lot to learn when it comes to growing crops. A canola plant has **factors** (different types of things) that help and harm it when it is growing.

The information from CANowledge Time: The Good, The Bug, and the Canola and the rest of the activity book, will help you in this activity.

Can you help Chase and Amelia make a venn diagram to compare and contrast all of the **similarities** and **differences** between what might help or harm a canola plant?

As a reminder, a venn diagram can help us organize information we learn about and can be used for many different topics. The titles have been added.

1 example for each section has been provided.



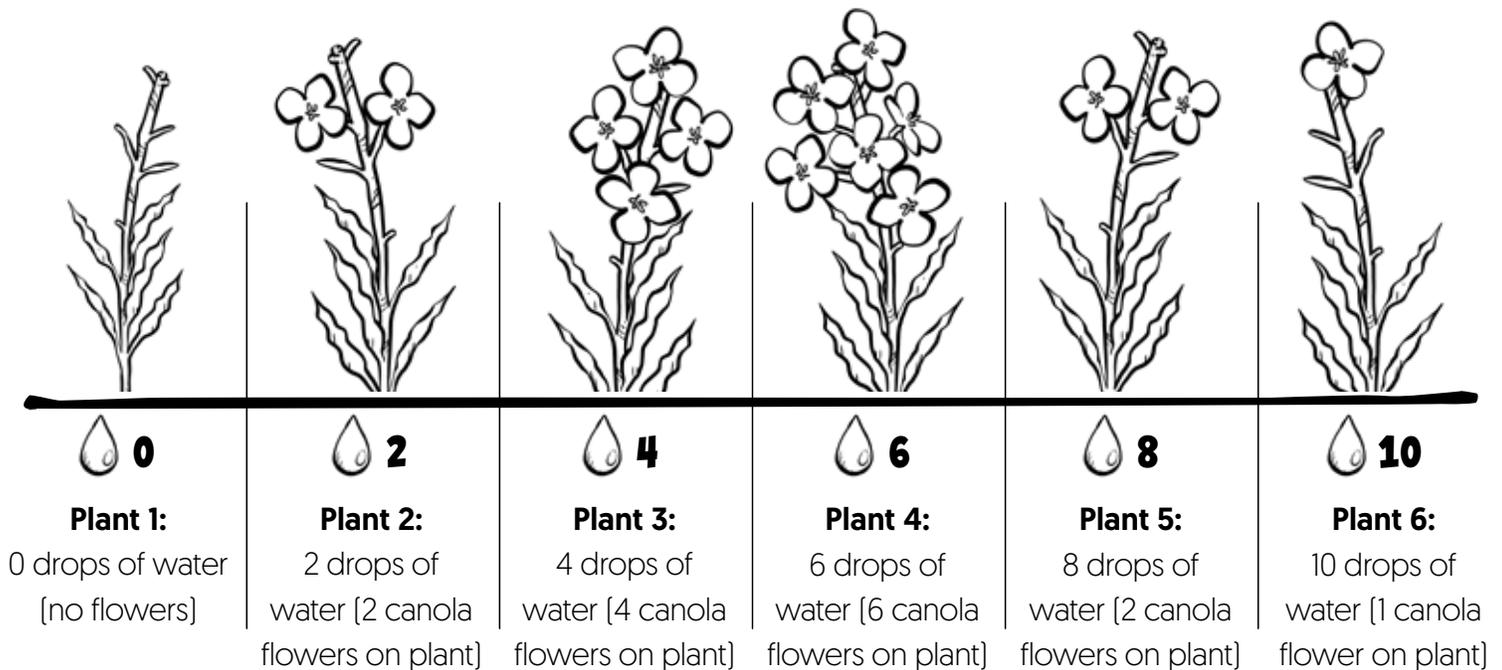
# How Much Water to Grow A Bee-you-tiful Golden Flower?

Grandpa Duffy explained to Chase and Amelia that canola plants need nutrients, [food that can be found in soil from broken down and decomposed plant life in the soil, or come from fertilizer], water, sunlight, and the right temperature to grow. Chase and Amelia wanted to see if they could grow canola plants like their grandpa, but in Grandma Duffy's greenhouse!



Being the scientist Amelia is, Amelia is curious to find out if different amounts of water would help their canola plants produce more flowers? Amelia convinced Chase to let her grow 6 canola plants from seed to flower over 7 weeks.

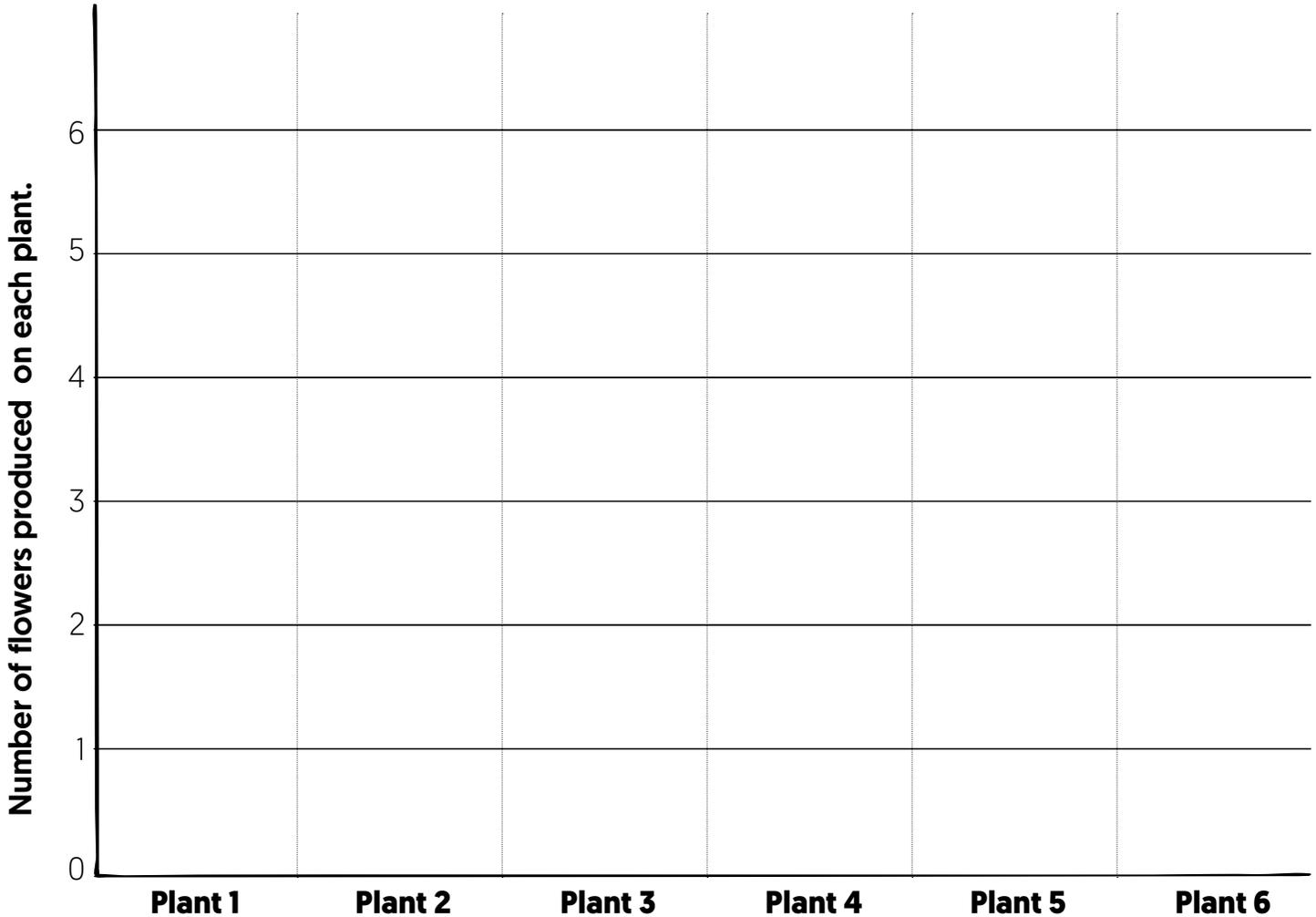
All plants were given the same type and amount of soil, sunlight, and nutrients. The soil for each plant also had the same amount of moisture before Amelia and Chase planted and watered the canola seeds. Each plant was given a different number of drops of water with an eye dropper once a week. Each canola plant produced a different number of flowers after 7 weeks:



**Can you help Chase and Amelia put their results into a picture graph on the next page?**

# How Water Affects the Growth and Development of Canola Flowers

You will draw the number of flowers that grew on each plant in the graph below.



## Conclusion:

1. By looking at the graph and the results, which plant produced the greatest number of flowers? How many drops of water was it given?

---

---

2. By looking at the graph and the results, which plant produced the least number of flowers? How many drops of water was it given?

---

---

3. What future improvements (ideas) would you suggest to Chase and Amelia to improve their experiment or results in the future?

---

---

# Let's Play - Elimination

In Elimination, you will pretend you are a canola farmer trying to get rid of the bad insects harming your canola plant.

## Materials:

- 2, 6-sided dice
- Game Board
- Marker or something to cover up numbers as you play
- Partner

**Objective of the game:** To cover up 5 numbers to form a row first on your gameboard.

**Number of players:** 2

## Getting ready to play:

1. Each student will need a partner, their own game board, a marker or something to cover up their game board.
2. The students will need 2, 6-sided dice.

## How to play:

1. Roll 2 dice together to determine how many total flea beetles and cabbage seed pod weevils you have on your canola plant.
2. From the total number rolled, count backwards by 2. [For example, if you rolled a 10 you would count backwards to 8].
3. From the new total number, subtract 2 from this new number. [The 2 represents the two ways you tried to destroy the flea beetles and cabbage seedpod weevils for that round]. The leftover number represents how many flea beetles and cabbage seed pod weevils you have left on your canola plant. Cross off the number on the game board. If you do not have any matching numbers, you will have to wait until it is your turn again to try again.
4. The first person to get 5 in a row WINS and jumps up to say "Hooray my canola plant is saved!" as they were able to save their canola plants the quickest!



# Let's Play - Elimination



<b>10</b>	<b>3</b>	<b>5</b>	<b>0</b>	<b>4</b>
<b>1</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>7</b>
<b>9</b>	<b>3</b>	<b>FREE SPACE</b>	<b>1</b>	<b>2</b>
<b>6</b>	<b>8</b>	<b>4</b>	<b>9</b>	<b>7</b>
<b>10</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>2</b>

# Cooking with Chase and Grandma Duffy

## Monster Cookies! <sup>7</sup>

Fats are a very important part of our diet. Fats provide your body with energy, helps your body use certain vitamins, make hormones, and protects your organs. Did you know that fats that are solid at room temperature such as hard margarine, lard, coconut oil, shortening and butter contain saturated fats that can raise your risk of developing heart disease? Choose foods often made with healthy fats, like canola oil.

After Chase has been helping Grandpa Duffy during harvest, one of Grandpa Duffy and Chase's favourite treats to share is Grandma Duffy's monster cookies! After all the work you have been doing, take a break and with the help of an adult, make some TASTY MONSTER COOKIES!!!

**Yield:** 3 dozen cookies

### Ingredients

- ½ cup (125 mL) canola oil
- ½ cup (125 mL) non-hydrogenated canola margarine
- 1 cup (250 mL) brown sugar
- 1 cup (250 mL) granulated white sugar
- 3 eggs
- 1 Tbsp (15 mL) vanilla extract
- 2½ cups (625 mL) all-purpose flour
- ½ tsp (2 mL) salt
- 2 tsp (10 mL) baking soda
- 1 ½ cups (375 mL) rolled oats
- 1 cup (250 mL) candy coated chocolate pieces
- 1 cup (250 mL) chocolate chips
- ½ cup (125 mL) chopped pecans (optional)



### Instructions

1. Preheat oven to 350°F (180°C).
2. Beat canola oil, margarine, brown sugar, granulated sugar, eggs and vanilla until light and fluffy.
3. In a separate bowl combine flour, salt and baking soda, then add to the egg mixture.
4. Fold in the rolled oats, candy coated chocolate pieces, chocolate chips and pecans.
5. Using a tablespoon, drop the dough onto a greased baking sheet, or a baking sheet lined with parchment paper.
6. Bake approximately 10 minutes until golden brown.
7. Clean up.
8. Cool and enjoy!



# Chase's Crazy Canola Crafts and Science Experiments

## Light It UP!!! <sup>8</sup>

What do you think happens when we mix together canola oil, water, and effervescent antacid tablets? With the help of an adult, find out what happens by trying out this glowing bubblicious experiment.

Wow! Effervescent antacid tablets are some big words! An effervescent antacid tablet is a type of medicine that an adult might take if they have a stomachache.

### Materials:

- 1 sandwich sized sealable sandwich bag
- ½ cup water (125 mL)
- Food colouring of your choice
- 1½ cups canola oil (375 mL)
- Effervescent antacid tablet (or any similar antacid tablet that contains 1000 mg citric acid and 1916 mg sodium bicarbonate)
- Highlighter (optional-to make the bubbles glow)
- Paper towel (optional)
- Black light (optional)

### Instructions

1. Make a prediction about what might happen when you mix canola oil, water, and effervescent antacid tablets (provide a best guess based on some research from talking to adults).
2. Gather your materials.
3. Pour the ½ cup of water into a sealable sandwich-sized bag (avoid filling the bag beyond half its size).
4. Add two to three drops of food colouring of your choice and mix together.
5. Pour 1½ cups of oil into the bag (avoid filling the bag beyond half its size) and firmly seal the bag. Observe what happens to the oil and the water. Which substance floats to the top?
6. Break one antacid tablet into pieces (only use one tablet at a time). Drop the pieces into the bag. What do you think is happening? Why?
7. To create a glowing bubble lamp, follow steps 1-6. To make fluorescent water with a highlighter, use the highlighter (yellow or green works best) to colour a paper towel sheet until the paper towel is completely covered.
8. Soak the coloured sheet in a ½ cup of water for 15 seconds, until all the colour has been absorbed by the water and the towel is almost inkless, or a lighter shade of the highlighter colour.
9. Remove and wring out the paper towel to get as much of the ink into the water as you can.
10. Now repeat steps 2-4 with the highlighter water in place of the food colouring water. For a glowing effect, add effervescent antacid tablet pieces to the bubble lamp in a dark room. Point a black light at the bag and watch the glowing bubble lamp in action!
11. Was your prediction correct? Yes or no and why? Do you have any questions you can think of that you might like to test in the future?
12. Clean up.

**Note to adult helper:** With help for explanation see 8a in Additional Teacher/Parent Resource Page. This activity is best done with 1 person holding the baggie while the other person pours.

# Chase's Crazy Canola Crafts and Science Experiments

## Upside Down PLOP! <sup>9</sup>



Have you ever tried mixing canola oil, salt, and water together? What happens? Try this science activity with the help of an adult to find out!

### Materials

- Tap water
- Salt from a salt shaker
- Canola oil
- Narrow jar [size of jar is optional]
- Food colouring [your choice]
- Funnel [optional]

### Instructions

1. Make a **prediction** [best guess] as to what happens when you mix canola oil, salt, and water together?
2. Fill a narrow jar  $\frac{2}{3}$  full of water. Have an adult show you where  $\frac{2}{3}$  is on the bottle. Use a funnel to assist if your jar opening is narrow.
3. Fill your narrow jar  $\frac{1}{3}$  full of canola oil. Use a funnel to assist if your jar opening is narrow.
4. Add ONLY 1 drop of food colouring of your choice to the water.
5. Look at what the drop of food colouring is doing and where it is in the mixture. Why?
6. Using a salt shaker, shake 3-6 shakes of salt into your creation. Use a funnel to assist if your jar opening is narrow. What happens to the drop of food colouring? Why do you think this is happening?
7. Was your prediction right? Can you think of any other predictions and tests you can do with this experiment in the future?
8. Clean up.



**Note to adult:** Refer to Additional Teacher/Parent Resource Page 9a for additional information.

# Chase's Crazy Canola Crafts and Science Experiments

## Show What You Know! <sup>10</sup>

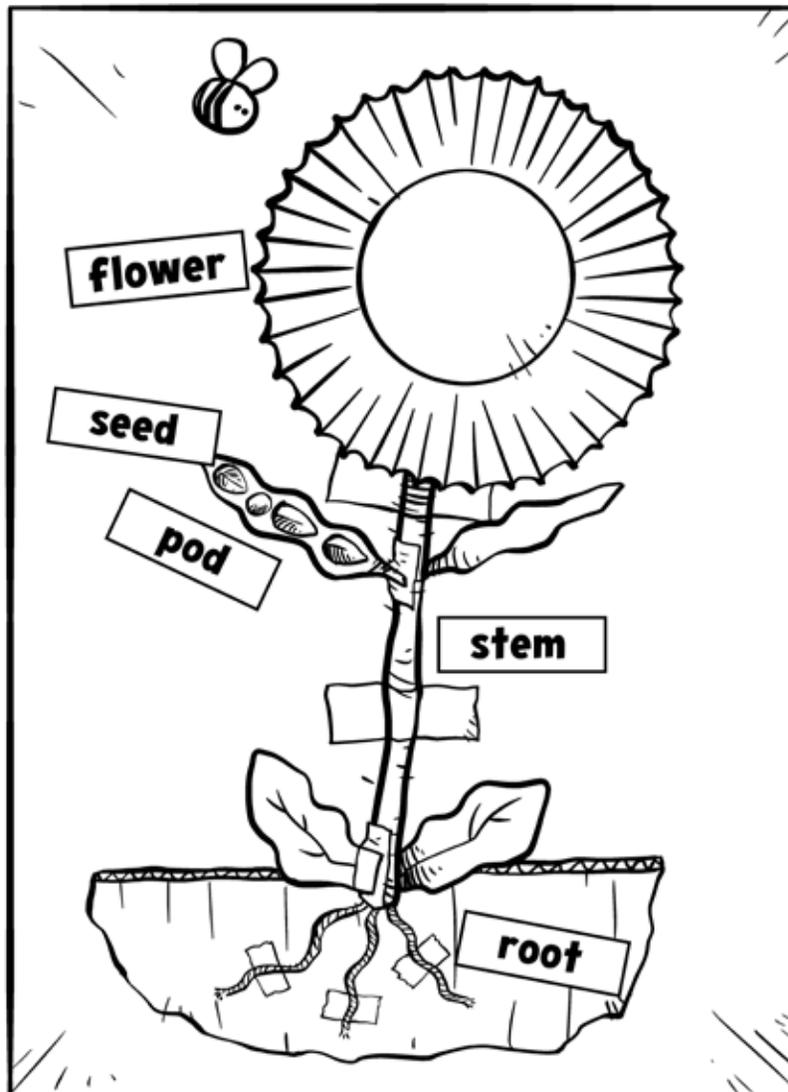
We have learned lots about canola! Using recycled materials, let's make a beautiful yellow canola flower on a separate piece of blank paper. Label all the parts of the canola plant at different stages and show one beneficial insect with it. The key words to include are: **flower, stem, root, seed, pod.**

**Hint:** [If you can't remember what a canola plant looks like, check out page 9!]

### Materials:

- A blank piece of paper
- Crayons or pencil crayons
- Scissors
- Various recycled items you can use to make your canola plant and beneficial insect [e.g., muffin liner, straw that can be coloured for a stem, yarn, or whatever else that can be used to create the plant].
- Glue
- Markers
- Tape

Here is an example.





# CANOLA Breakout!



A C O  
 U V X Q F C H M A  
 U V R Z D N N H O M Q K D  
 F P B E N E F I C I A L J C O T R  
 K T T X X B X W C L L Z E W F N P S U  
 P P R L L I A U N O Q E I E G V L M X D V  
 V O C L N O N S N Z L J S Q S I N H E Y J  
 Y M X Z A H K Y S C M R F Z E S H L E T Y X S  
 M F G O E T I V S E Y Z J N F V W F H Z V A L  
 K D E Q E M M Q I E D C O J X P Z G O I V G S O E  
 T K R T T G N I A E A Q T E M C Z Z K K J A V U Y  
 L A E N A Y S D K U B X J M Z M X J N P B L N M A  
 C U F M G N A Y B Y N V D Z A W V P G O L I L S Q M L  
 C H J E W I N G V Z T D C O O J R T D D Z Z A Z Z W G  
 P L I R N M X Z G C P O F A B Y O S K E F H A K N Y F  
 H C G P R I D R A L R Y H N Z I R L L A U A A A R  
 S R E P E Y F A P S F Q Y D O B U R Y R T J X L P  
 D P N R G G N I S N W X C V D L S H T M H N J O P  
 E C Z E N I B M O C H H O L Q A D O E A I L A  
 L E R L Z E O I L M C O I W I S D C R B L V E  
 O S U C W Z I X H G E M Y S V U A A I Z J  
 M U S S Q A U C H J J Q S D K M V N W D R  
 Z F W F M E W E D Q M R O T C A R T T  
 P F R E Y N P P K T D J D T N E A  
 X P O J D X J X L L E X L  
 P H J P N A D C H  
 Z I U

COMBINE  
 MEAL  
 TRACTOR  
 COTYLEDON  
 BENEFICIAL

FEED  
 OIL  
 POLLINATE  
 GERMINATE  
 FARMER

FLOWER  
 SEED  
 INSECT  
 EMERGENCE  
 CANOLA

# Let's Play! - One Metre Canola Dash Madness! <sup>11</sup>

Canola plants grow roughly between 1-2 metres (m) tall. The average pod length for canola is 5 centimetres (cm) and the diameter of a seed is 1 millimetre (mm).

[**Diameter** is the longest distance across a circle from edge to edge.]

## Materials:

- Ruler
- Metre stick
- Pencil
- Paper

## Objective of the game:

To earn the highest number of points by estimating and measuring the actual length of objects in the classroom with your teammate.

## Getting Ready to play:

[**Note to teachers or parents:** This game can be competitive. Be sure to group students into fair teams ahead of time regarding skill set.]

1. Your teacher will assign you a partner and together you will compete against other groups.
2. Your team will need both a metre stick, ruler, pencils and the chart on page 43.



# Let's Play! - One Metre Canola Dash Madness!

## How to play:

1. The teacher or guardian will tell the groups when they can begin and end.
2. With your partner, look around the room and find the following objects that you both can estimate the length of for the following categories:
  - 3 objects that measure 1 m
  - 3 objects that measure 10 cm
  - 3 objects that measure 5 cm
  - 3 objects that measure 1 mm

**\*How to estimate:** look at the object and give your best guess of how long the object would be without using a ruler or metre stick\*

3. Write down the name of your object in the table [see example].
4. Record the estimated length of your object in the estimated length section of the table [see example].
5. Next, measure the length of the object with either a ruler or metre stick to see how close your partner and you were with your estimate. Record the actual length of the object in the table [see example].
6. Your group will then record the total number of items you were successfully able to finish measuring with your ruler or metre stick for bonus points in the table.
7. If your group is within 1 mm of all required measurements for that object, give your group an extra 5 points for that specific object [see example under "is the item within 1 mm of estimate?"].
8. Your group can earn 2 additional bonus points by correctly identifying how many millimetres are in a centimetre, and how many centimetres are in a metre [record your answer in table below].
9. Total your groups overall score [in "total points" section of table] and share your results with other competing groups to determine a winner.



# One Metre Canola Dash Madness!

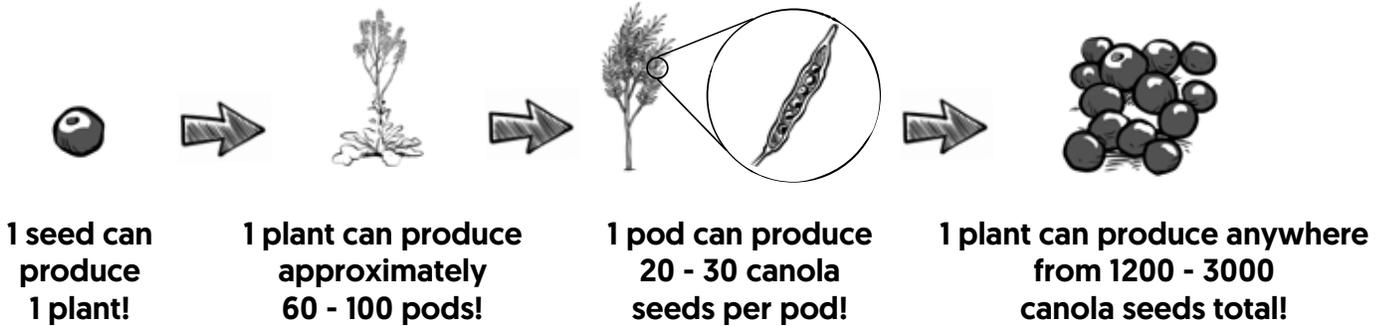
## Gameboard

	Item you found that you think is close to the length you are estimating	Estimated length	Actual length	Is the item within 1mm of the estimated length? (yes = 5 points no = 0 points)
<b>Example:</b> Object 1: 1m	<b>Example:</b> Desk height	<b>Example:</b> 1m	<b>Example:</b> 1m and 22cm	<b>Example:</b> no = 0 points
Object 1: 1m				
Object 2: 1m				
Object 3: 1m				
Object 1: 10cm				
Object 2: 10cm				
Object 3: 10cm				
Object 1: 5cm				
Object 2: 5cm				
Object 3: 5cm				
Object 1: 1mm				
Object 2: 1mm				
Object 3: 1mm				
<b>Total of how many items estimated and measured (1 bonus point for each item)</b>	<b>Answer:</b>			
<b>How many centimetres (cm) are in 1 metre (m)? (2 bonus points)</b>	<b>Answer:</b>			
<b>How many millimetres (mm) are in 1 centimetre (cm)? (2 bonus points)</b>	<b>Answer:</b>			
<b>TOTAL POINTS:</b>				

# Let's Play! - Back-To-Back <sup>13</sup>

**\*Note to teachers or parents:** This game can be competitive. Be sure to group students who are at a similar skill level.\*

**One canola seed can produce the following:**



As you can imagine, during seeding, a farmer has to know how to add and multiply so they get the best yield possible.

---

## Are you as sharp as a canola farmer?

In this game, you will determine how well you know your facts and figures!

### Materials:

- Sheets of paper
- Markers

### Objective of the game:

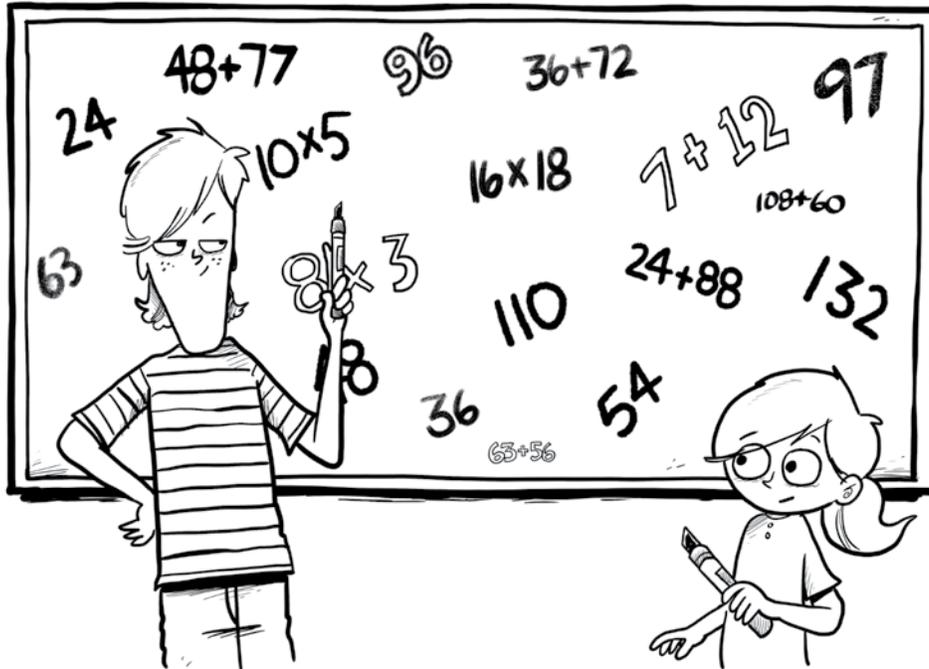
To display how well you know your addition and multiplication facts to help Grandpa Duffy determine the best canola yield possible!

**Numbers of players:** smaller groups to whole class

### Getting ready to play:

1. Classmate 1 and 2 both stand at a whiteboard facing away from each other with a whiteboard marker.
2. A third classmate [classmate 3] stands off to the side to see what both classmate 1 and 2 are writing on the board at the same time and can be holding a calculator. Classmate 3 also wants to be positioned so that they can have the whole class in their peripheral vision.
3. Audience members will want access to their Chase Duffy's MULTIPLICATION FACTS chart on page 66.
4. Remember, a teacher or guardian can overrule any play at any given time if needed.

# Let's Play! - Back-To-Back



## How to play:

1. To begin game play, classmate 3 will say "numbers up." Both classmate 1 and 2 will write a number on the whiteboard at the same time and step away from their numbers, uncovering their numbers at the same time so the class can see the numbers clearly on the board.
2. The third classmate is the only person who can hold a calculator to check the answer for speed if needed and then listens to classmates in the audience to see who gives the first correct answer.
3. The audience members multiply or add the two numbers on the board together (based on teacher's direction). Audience members can access their Chase Duffy's Multiplication Facts chart on page 66 if needed, or use other teacher approved accommodations.
4. A competitor from the audience wins by saying the correct answer first. If an incorrect answer is given that audience member's turn is finished for that round. The rest of the audience keeps guessing until a correct answer is provided. The round is complete and a new round starts.
5. If a tie is determined, only those people involved in the tie will play off in a second round in the same way.
6. Once a correct answer is given, the winning competitor from the audience and classmate 3 switches.
7. After 3-5 rounds, 2 new audience members are selected who have not already had a turn and switch roles with the two students writing down the numbers. These individuals are selected by the teacher.

# Let's Play! - The Quickest Chef <sup>14</sup>

**Chefs sometimes improvise and substitute ingredients. Did you know you can use canola oil in place of butter or shortening in cookie recipes to make a more heart healthy cookie?**

You and another chef will play a round of The Quickest Chef to use your knowledge of fractions to determine who can substitute canola for shortening the quickest!

## Materials:

- 2 players
- deck of playing cards

## Objective of the game:

This game is similar to the card game, war. The winner wants to have the largest pile of cards by the end of the game.

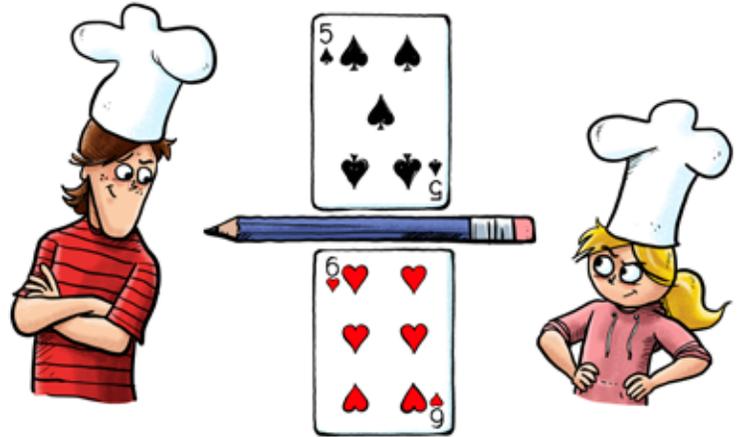
## Number of players: 2-3

## Getting ready to play:

1. Remove the following cards from the deck:  
Jacks, Queens, Kings, Ace, and Jokers [if included].

## How to play the game:

1. Students draw 1 card each from the decks.
2. Student place their cards face up in front of themselves and line them up so they are vertical, or look like a fraction, having a numerator and denominator.
3. Together, the students then determine whose fraction is the largest. For example, if one student draws a 5 and the other student draws a 6, when the cards are lined up, the students have to decide who has a larger fraction,  $5/6$  or  $6/5$ ? The student with the fraction  $6/5$  would win. The winner of the round takes all the cards for that round.
4. If the cards are the same, the students each take one more card off the top of the deck and repeat the process. However, students only look at who has the biggest fraction using the new cards drawn off of the top. Whoever has the largest fraction now wins all of the cards for this turn [4 cards in total].
5. Students play until the cards are all gone from the centre deck and determine at the end who has the biggest pile of cards.



# Let's Play! - Area and Perimeter of a Canola Field <sup>12</sup>

Every year before seeding a farmer has to think about the area of canola and other crops they want to grow. They start planning very early for this to make sure they have enough seed during seeding time.

Grandpa Duffy would like your help to determine the area and perimeter of his field.

## Materials:

- 2 coloured markers or 2 coloured pencil crayons [1 for each player]
- 2 players [evenly skilled]
- 2 dice [numbered 1-6]
- 1 piece of grid paper for each game with each square measuring 1 cm<sup>2</sup>

## Objective of the game:

Build up the largest amount of total surface area first on the grid paper.

## Number of players: 2

## Getting ready to play:

1. Each player chooses a coloured pencil crayon they will use in the game.
2. Find Chase's Duffy's MULTIPLICATION FACTS on p. 66 of this book.
3. Rip out the double-sided grid paper on p. 64-65.
4. Find 2, 6-sided dice with numbers 1-6 on the dice. Assign die 1 as length and die 2 as width.





# Cooking with Chase and Grandma Duffy

## Did Someone Say Pizza? <sup>15</sup>

Your body needs dietary fats for energy, to help your body grow and develop (and to help absorb vitamins A, D, E, and K). Choose foods with healthy fats such as nuts, seeds, fatty fish, avocados, vegetable oils (like canola oil) and soft non-hydrogenated margarine.

After completing a run through one of Grandpa's canola fields to practice for track season, Chase loves to help his grandma prepare homemade pizza! Cooking with his grandma creates a special family tradition that they both share.

With the help of an adult, try making this delicious pizza to enjoy! The possibilities are endless for toppings! **Remember: if you don't have whole wheat flour that's okay, this pizza can be made with all-purpose flour too!**

**Yield:** 8 servings

### Ingredients:

- 1 cup whole wheat flour [250 mL]
- 1½ – 2 cups all-purpose flour [375-500 mL]
- 2 Tbsp wheat germ [30 mL]
- 1 pkg [7g] quick rising instant yeast [1 pkg]
- 1 cup warm water [250 mL]
- 1 Tbsp canola oil [15 mL]
- ¼ tsp salt [1 mL]

### Instructions:

1. In a large bowl, mix whole wheat flour, wheat germ, 1 cup [250 mL] all-purpose flour, salt and yeast.
2. Stir in warm water [slightly warmer than room temperature] and canola oil.
3. Gradually stir in enough of remaining all-purpose flour to make a soft dough. Knead on lightly-floured surface until smooth and elastic.
4. Shape dough into a ball. Cover and let the dough rest for 10 minutes before rolling out to be about 2.5-5 cm thick.
5. Place on greased baking sheet and top with your favourite ingredients! Be creative!
6. Bake at approximately 400°F [200°C] for approximately 40-60 minutes or until the crust appears golden brown on the bottom. If you use excessive toppings, the pizza may take longer to bake [1- 1.5 hours]. Additionally, check out Canola Eat Well for a great tomato sauce recipe: <https://canolaeatwell.com/recipe/pizza-dough-quick-pizza-sauce/> Have an adult help you check the crust to determine doneness.
7. Clean up.



# The Journey of the Canola Seed: From Grain Bin to Bottle!

After canola seeds are harvested from the field, the farmer stores them in grain bins on their farm. The farmer then transports the seeds to either a grain elevator or a processing plant.

The seeds at the elevator are stored in giant grain bins until a train can transport them to export markets.

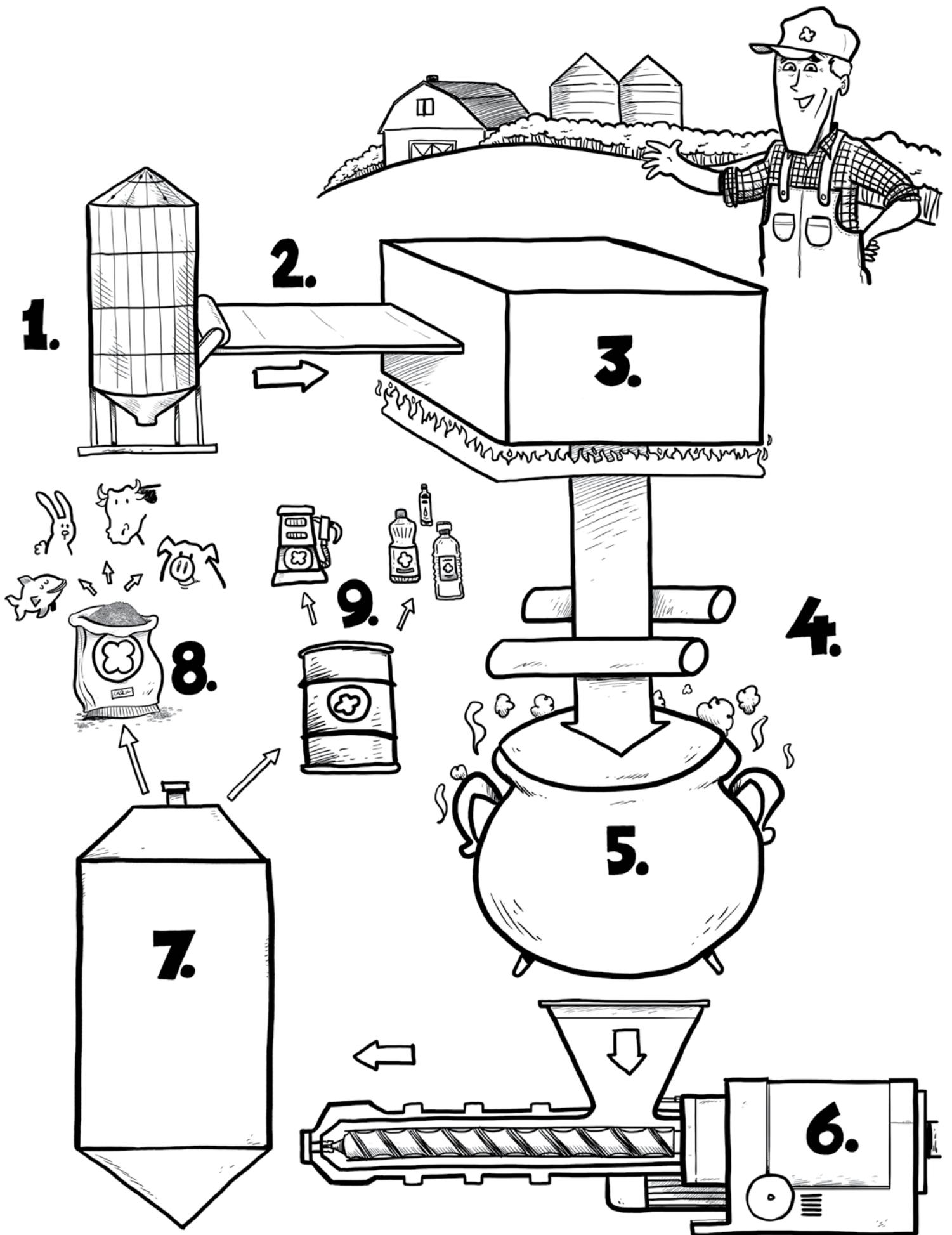
1. At the processing plant, the seeds are stored in giant bins until they are ready to be crushed to obtain canola oil and meal.
2. The canola seeds are then thoroughly cleaned.
3. Next the canola seeds are pre-heated to a specific temperature so the seed coats do not shatter.
4. Once the pre-heated canola seeds are heated to an optimal temperature, the canola seeds are flaked. This means the canola seeds are pressed flat, by a set of steel rollers, which are like a set of giant rolling pins. Flaking helps to crack open the seeds' coat cell wall.
5. Flaked canola seeds are cooked at a high temperature in a giant pot called a cooker.



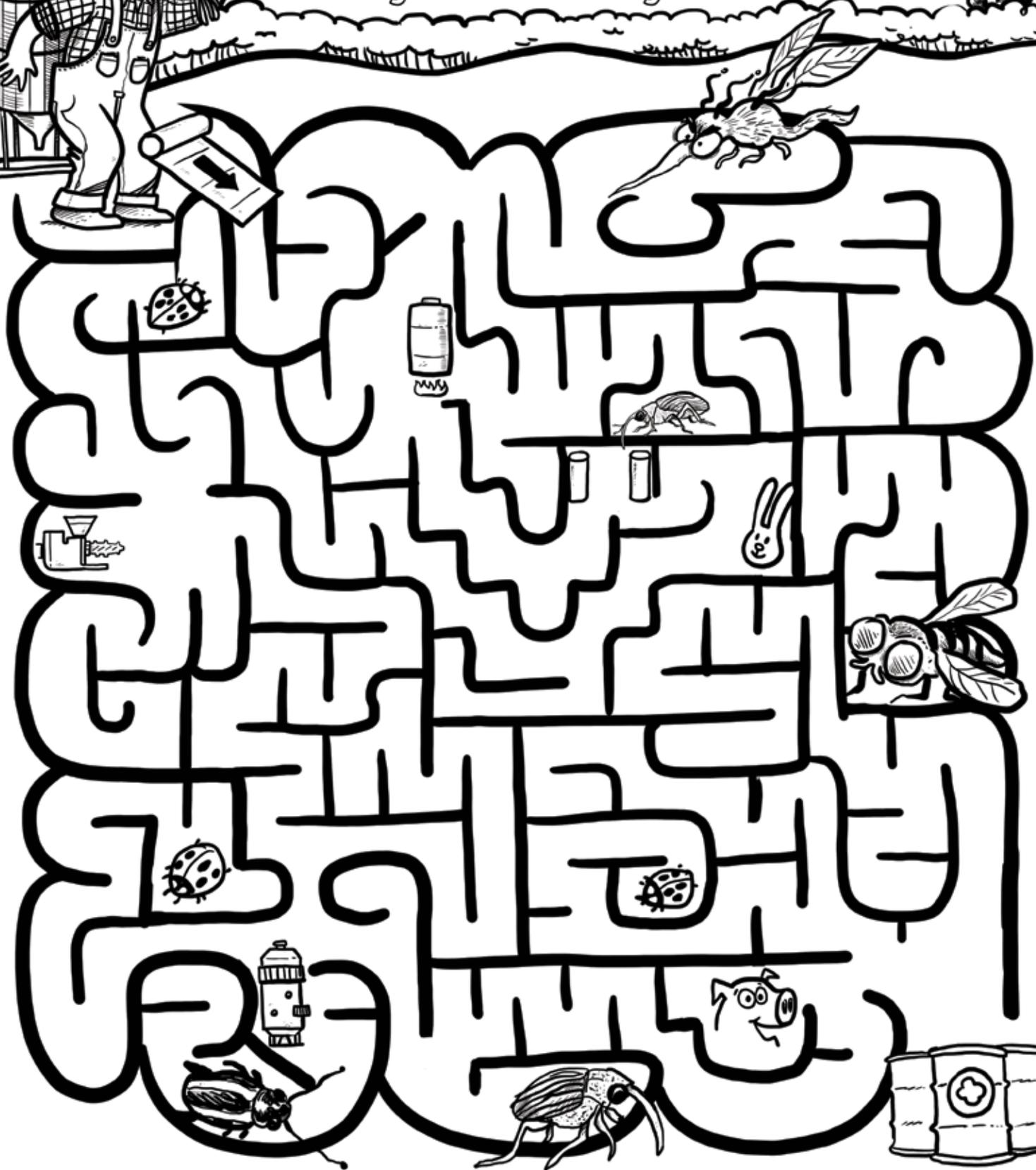
6. The canola seeds are then passed through a machine called a screw press or expeller. The expellers job is to squeeze most of the oil out from the seeds. Two products are left - the canola oil and the solid seed material called "cake fragments".
7. Once the cake fragments leave the screw press, the cake fragments are then washed in a machine called an extractor to separate out any leftover canola oil from the canola cake fragment. This step might be repeated several times to get all the canola oil from the canola cake fragments.
8. As soon as the cake fragments leave the extractor, the canola cake fragments are now called "canola meal". This is used to produce a variety of different things, including pellets, which are used to make animal feed.
9. The oil processed from the expeller or screw press is crude oil and must be further refined to make edible and non-edible products. Crude oil goes through more steps to be made into the canola oil used in the kitchen for cooking, baking, frying or even made into non-hydrogenated margarine!

It can also be used in cosmetics, printing inks, sunscreen, biodegradable gels (to help fight forest fires) or turned into biofuels (fuel for trucks, buses and tractors).





Uh-Oh! Help Grandpa Duffy  
Get His Canola Seeds  
Through the Crushing Plant!



# Chase's Crazy Canola Crafts and Science Experiments

## Stained Glass <sup>16</sup>

A canola plant journeys through many steps before it becomes canola oil! Make a picture of your favourite processing stage, or of your favourite item that is produced from canola and be sure to hang it in the window.

### Materials:

- 1 piece of white paper (any shape or size)
- Pencil crayons
- Paper towels
- Paintbrush
- Canola oil
- Newspaper or garbage bag to protect your surface from paint

### Instructions:

1. Use a white piece of paper to draw a colourful picture with pencil crayons.
2. Lay picture flat on a paper towel.
3. Using a paintbrush, cover the paper with enough canola oil to soak through completely, making the paper almost translucent (translucent means clear or see through).
4. Once the oil soaks in, wipe excess oil away with paper towel.
5. Clean up.
6. Allow paper to dry for at least 48 hours before hanging in a window.



# Chase's Crazy Canola Science Experiment

## Ultimate Brain-Build-A-Thon Challenge!

Simple materials and designs are sometimes the best building supplies and techniques for various projects. Canola flowers, for example, grow a very strong root system to help anchor the plant to the ground. The canola flower's shape and colour helps with the plant's pollination process. The pod is designed to protect the developing seeds from damage.

In this next set of activities, challenge yourself to see what you can design and build! You will have to make one to two batches of sugar cookies and an icing of your choice. You will then use the cookies and icing somehow in all of your designs.



## Sugar Cookies <sup>17</sup>

### Ingredients:

- $\frac{2}{3}$  cup sugar (150 mL)
- $\frac{1}{2}$  cup canola oil (125 mL)
- 2 tsp vanilla (10 mL)
- 2 eggs (2)
- $2\frac{1}{2}$  cups flour (625 mL)
- 2 tsp baking powder (10 mL)
- $\frac{1}{2}$  tsp salt (2 mL)
- 1-3 Tbsp (45 mL) of milk (optional)



### Directions:

1. Preheat oven to 350°F (180°C)
  2. In a large bowl or stand mixer, beat together sugar and canola oil until light and fluffy; beat in vanilla and eggs, one at a time.
  3. Whisk together flour, baking powder and salt; stir into canola mixture and mix until well combined.
- Note:** If dough seems dry add 1 Tbsp (15 mL) of milk at a time to the dough to get the dough to come together.
4. Divide dough in half; shape into discs. Wrap in plastic wrap; refrigerate for 30 minutes.
  5. Roll out dough on floured board and cut cookies using favourite cookie-cutters. Transfer cookies to parchment paper lined cookie sheets. Bake for about 10 minutes or until lightly browned.
  6. Clean up.
  7. Cool and ice with icing of your choice to build your structure.

### Other Materials for Build-A-Thon Challenge:

- Bag of mini marshmallows
- 20 toothpicks
- 1 toy car
- 1 sheet of legal paper (8.5 x 11 inches)
- 1 paper clip
- 1 hardboiled egg
- Assorted washed and sanitized coins
- Scissors
- 2-3 metres of tape (masking tape or scotch tape would be fine)
- 30 cm ruler
- Icing of your choice that hardens

# Challenge 1: Drive In

## Directions:

1. Research and design a structure that has a roof that a toy car must fit under. All items must be used in the materials list in the design and construction of the structure.
2. Include 1-3 sketches in the Prediction/Research area of this page. The roof must cover the length of the car. The roof must also leave at least 5 cm between the top of the car and the roof.

## Materials:

- Scissors
- 8-10 sugar cookies
- 20 miniature marshmallows
- 20 toothpicks
- 1 sheet of paper [8.5 x 11 inches]
- 1 paper clip
- 1 metre of tape of your choice
- 1 average small toy car
- 30 cm ruler
- Icing of your choice that hardens

## Prediction/Research:

Using all the materials, what structure can you build that your toy car can fit under?

## Observations:

How well did your structure work?

---

---

---

---

---

---

---

---

What problems arose with the build?

---

---

---

---

How high and long is your structure?

---

---

## Conclusion and Future Modifications:

What can you do to improve your design?

---

---

---

Can you draw an example?

Test your modification. Did it work?

---

---

---

---

---

---

---

---

# Challenge 2: Eggs Away!

## Materials:

- Scissors
- 8-10 sugar cookies
- 30 miniature marshmallows
- 20 toothpicks
- 1 sheet of paper [8.5 x 11 inches]
- 1 paper clip
- 1 metre of tape of your choice
- 1 Hardboiled egg
- Icing of your choice that hardens



## Directions:

1. Design an egg-safe contraption that keeps your whole egg safe when dropped from different heights. Use the materials listed. Include 1-3 sketches in the Prediction/Research area of this page.
2. Next, drop your egg in its contraption from 30 cm. Then, continue to and go up by increments of 10 cm each time until the egg cracks.
3. If you have the help of an adult, determine the maximum height reached before the egg cracks. Continue to drop the egg until it is no longer safe to do so.

## Prediction/Research:

## Observations:

Did your egg survive the following egg height drops?	Place a [checkmark for YES or X for No]
30 cm	
40 cm	
50 cm	
60 cm	
70 cm	
80 cm	
90 cm	
100 cm	
Max height reached before egg cracked or until it was no longer safe with the help of an adult to drop egg structure from [cm]:	

## Conclusion and Future Modifications:

How high could you drop the egg safely with the help of an adult before the egg cracked?

\_\_\_\_\_

\_\_\_\_\_

What worked well and not so well in your structure?

\_\_\_\_\_

\_\_\_\_\_

What can you do to improve your design?  
Can you draw an example?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Test your new design. Did the improvement work?

\_\_\_\_\_

\_\_\_\_\_

# Challenge 3: London Bridge Isn't Falling Down...

## Directions:

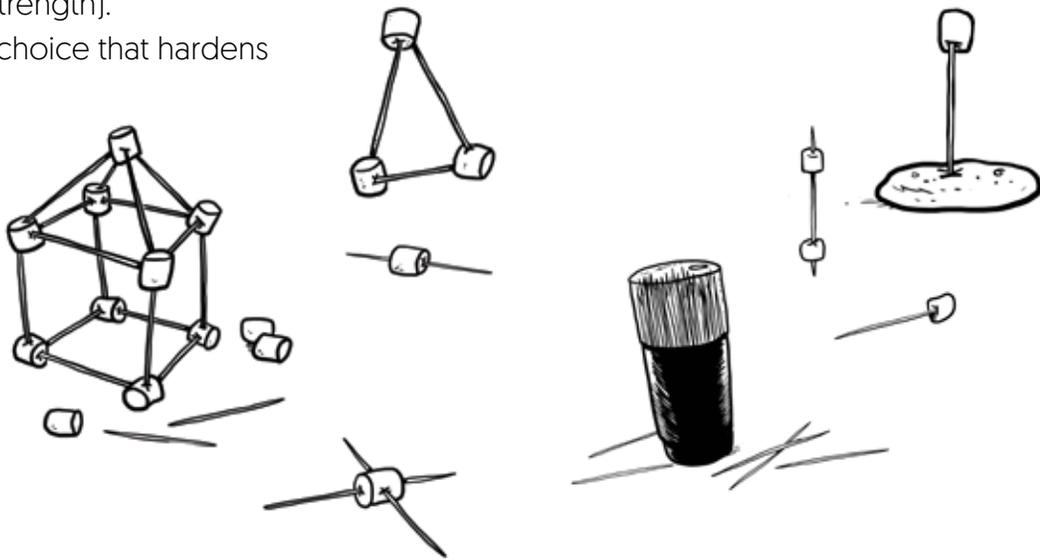
1. Research and design a bridge, using the materials below, to determine how many smaller objects, such as clean and disinfected coins it can hold.
2. Research to see what improvements can be made to your bridge so that you can add more objects or more mass to your current bridge design.

To help you with your design, in Google enter the following phrases in the search bar to help you with your research:

1. What makes bridges so strong video
2. Nova super bridge build a bridge

## Materials:

- 30 miniature marshmallows
- 6-8 sugar cookies
- 20 toothpicks
- Clean and disinfected objects [e.g., coins, washers, rocks] [You may use other items that are clean and in similar mass to each other. These items will be used to determine the bridge's strength].
- Icing of your choice that hardens



## Prediction/Research:

## Observations:

How many items or what maximum mass did your bridge hold before it collapsed?

---

---

---

---

---

---

---

---

---

---

**Conclusion and Future Modifications:**

How well did your structure work? What problems arose with the build?

---

---

---

How tall, wide, and long is your structure?

---

Challenge a family member or friend to see if they can design and build a bridge and then test your bridges to determine who's bridge design can hold more mass [or amount of objects].

---

---

How many of the same items with the same mass can your structure hold compared to a classmate, adult, or friend?

---

---

---

---

What would you do to improve your design?

---

---

---

---

Can you provide a sketch?

Build and test your improvement.

Did the improvement work?

---

---

---

---

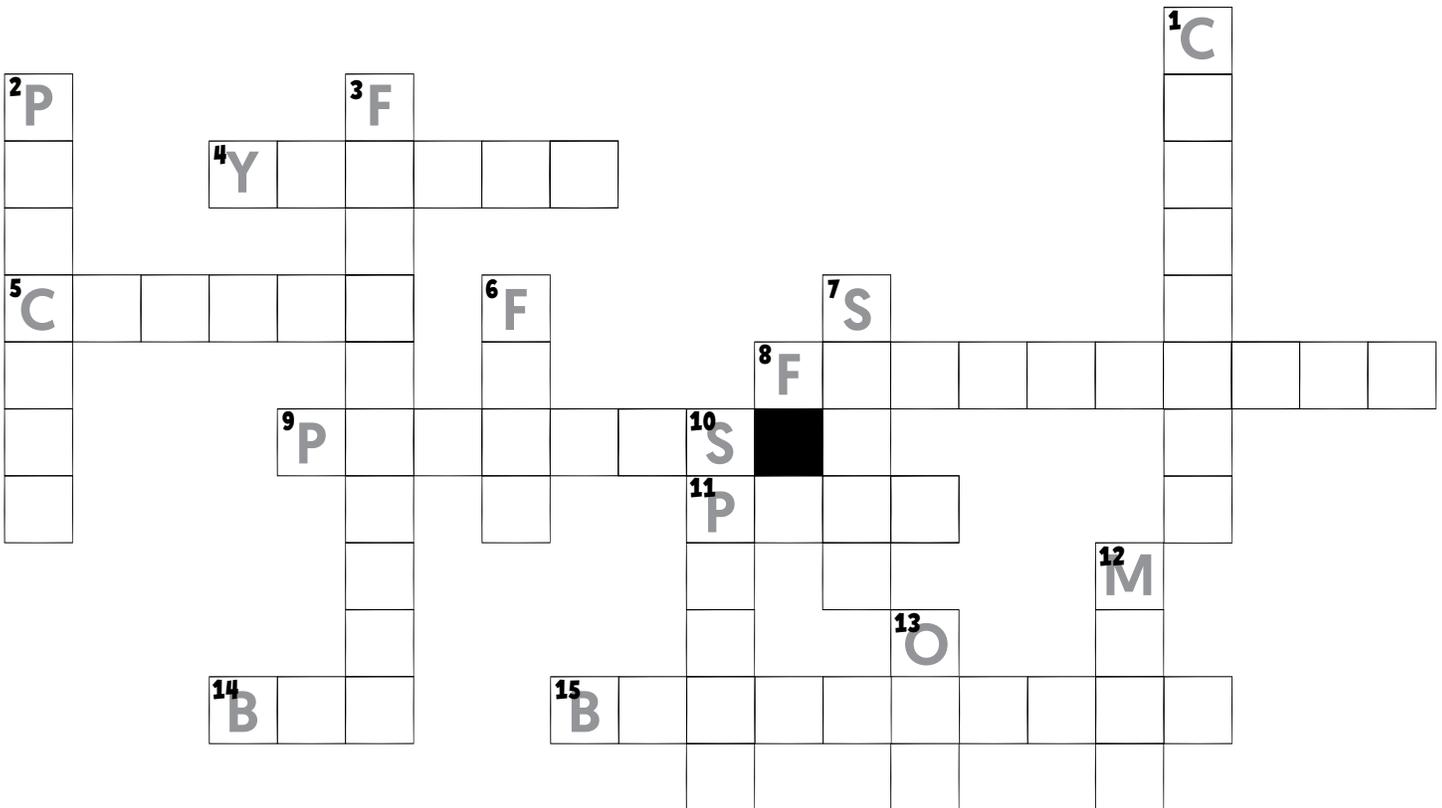
---

---

---



# Canola Craze!

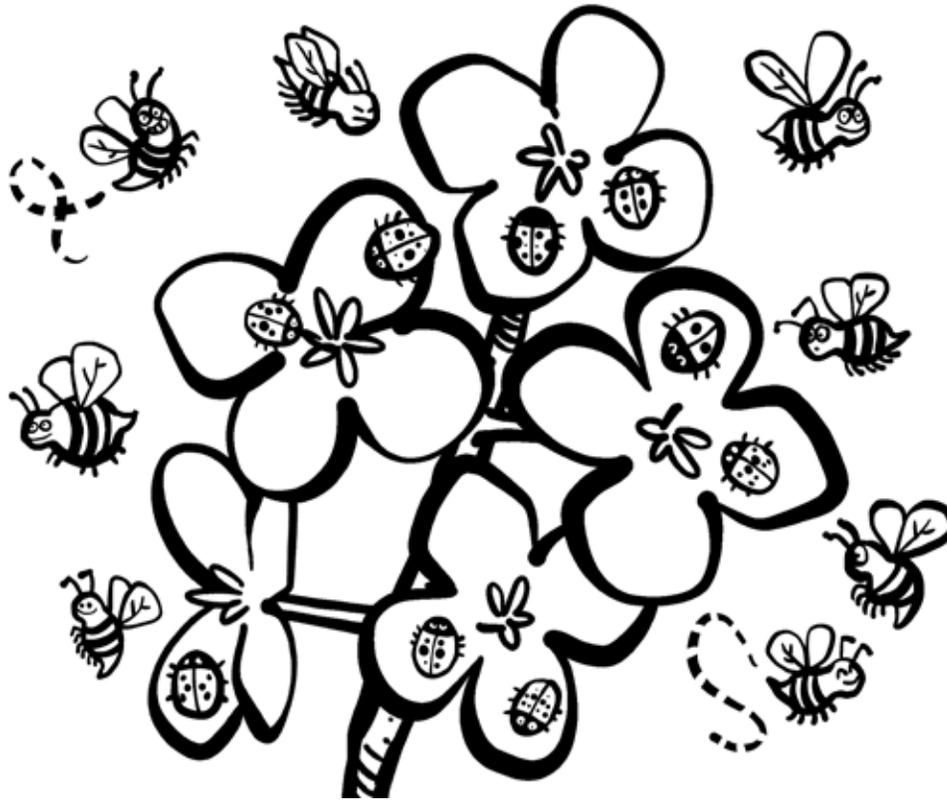


## ACROSS

4. The colour of canola flowers.
5. A great Canadian invention.
8. Used as food source to grow canola.
9. Feed made from leftover canola meal.
11. Where you can find canola seeds.
14. Insect that pollinates canola flowers.
15. Insects that help the canola plant grow.

## DOWN

1. Process used to get canola oil from the canola seed.
2. A great snack that uses canola oil.
3. Insects that eat the leaves of young canola plants.
6. Time of the year when canola is harvested.
7. Where the canola oil comes from.
10. Time of the year when canola is typically seeded.
12. The leftover material from the canola seed.
13. Used for cooking, cosmetics, biodiesel, ink, margarine, airplane de-icer.



## Canola Craze!

### Answer Key

---

**canola** A great Canadian invention.

**meal** The leftover material from the canola seed.

**oil** Used for cooking, cosmetics, biodiesel, ink, margarine, airplane de-icer.

**beneficial** Insects that help the canola plant grow.

**flea beetle** Insects that eat the leaves of young canola plants.

**pellets** Feed made from leftover canola meal.

**fertilizer** Used as food source to grow canola.

**crushing** Process used to get canola oil from the canola seed.

**fall** Time of the year when canola is harvested.

**spring** Time of the year when canola is typically seeded.

**pods** Where you can find canola seeds.

**seeds** Where the canola oil comes from.

**popcorn** A great snack that uses canola oil.

**yellow** The colour of canola flowers.

**bee** Insect that pollinates canola flower.

# Additional Teacher/Parent Resource Page

## 1. Cooking with Chase and Grandma Duffy: Nuts n Bolts.

*Content reprinted and adapted with permission from Canola! Eat Well:*  
[www.canoaleatwell.com](http://www.canoaleatwell.com)

- a. To involve children more in this recipe, split the cereal mix equally into 2-4 large sealable plastic bags. Have the child hold open their bag and drizzle the oil and spice mixture evenly over cereal mixture. Work together to seal the bag and have the child shake the bag up to coat the cereal mix evenly. Combine all the cereal in a large roasting pan or into two roasting pans evenly. Follow with steps 4-6 and if needed have an extra large mixing bowl to help split up and stir the mixture evenly. Please also note, this recipe yields 44 cups. Feel free to scale back to your desired yield.



## 2. Mixed Medium Painting.

*Content reprinted and adapted with permission from Canola! Eat Well:* [www.canoaleatwell.com](http://www.canoaleatwell.com)

## 3. Cooking with Chase and Grandma Duffy: Bannock.

*Recipe reprinted and adapted with permission from Alberta Health Services:*  
[www.learncanola.com/stempage](http://www.learncanola.com/stempage)

## 4. Fizzy Chaos!

*Adapted from:* [www.powerfulmothering.com](http://www.powerfulmothering.com) *Resource:* [www.learncanola.com/stempage](http://www.learncanola.com/stempage)

## 5. Berry Playdough!

*Adapted from:* [www.kiwico.com](http://www.kiwico.com) *Resource:* [www.learncanola.com/stempage](http://www.learncanola.com/stempage)

## 6. Juicy Gel Squish!

*Adapted from:* [www.kiwico.com](http://www.kiwico.com) *Resource:* [www.learncanola.com/stempage](http://www.learncanola.com/stempage)

- a. *Note to adult/teacher:* Agar is an edible gelling agent. This experiment is a cool example of how gelling agents work: The agar dissolves in the hot juice and, as it cools, traps the juice in a web of molecules. This gives the juice less space to move around, and it “sets” into a semi-solid substance. When you drip the juice mixture into cold oil, it gels on contact. Because oil and juice [which is water-based] don’t mix, the juice drops cling to one another, forming smooth spheres.

## 7. Cooking with Chase and Grandma Duffy: Monster Cookies

*Recipe reprinted with permission from:* <https://www.canolainfo.org/recipes/monster-cookies>

# Additional Teacher/Parent Resource Page

## 8. Light It Up!

*Adapted from:* [www.kiwico.com](http://www.kiwico.com) *Resource:* [www.learncanola.com/stempage](http://www.learncanola.com/stempage)

- a. *Note for adults on how experiment works:* As the antacid dissolves, the sodium bicarbonate and citric acid react together, creating carbon dioxide gas bubbles. You made a bubble lamp! As the bubbles rise, they give a temporary lift to the water. As the bubbles burst at the surface, the water falls back down.

## 9. Upside Down PLOP!

*Adapted from:* [www.kiwico.com](http://www.kiwico.com) *Resource:* [www.learncanola.com/stempage](http://www.learncanola.com/stempage)

- a. *Note to adult/teacher:* answer to the question: Oil is less dense than water, so it floats on top of water. When salt is dumped on, it sinks through the oil taking some of the oil with it to the bottom of the jar. As the salt dissolves in the water, the oil rises back up to the top of the jar creating movement over and over again. You can repeat adding salt multiple times.



## 10. Show What You Know

*Idea developed with inspiration from Canola! Eat Well:* [www.canolaeatwell.com](http://www.canolaeatwell.com)

\**Note:* With the following games, they can be adjusted based on the difficulty according to student age and skill level\*

## 11. One-Metre Canola Dash Madness

*Game adapted from:* [www.prodigygame.com](http://www.prodigygame.com) *Resource:* [www.learncanola.com/stempage](http://www.learncanola.com/stempage)

## 12. Area and Perimeter of a Canola Field

*Game adapted from:* [www.pinterest.ca](http://www.pinterest.ca) *Resource:* [www.learncanola.com/stempage](http://www.learncanola.com/stempage)

## 13. Back-To-Back

*Game adapted from:* [www.prodigygame.com](http://www.prodigygame.com) *Resource:* [www.learncanola.com/stempage](http://www.learncanola.com/stempage)

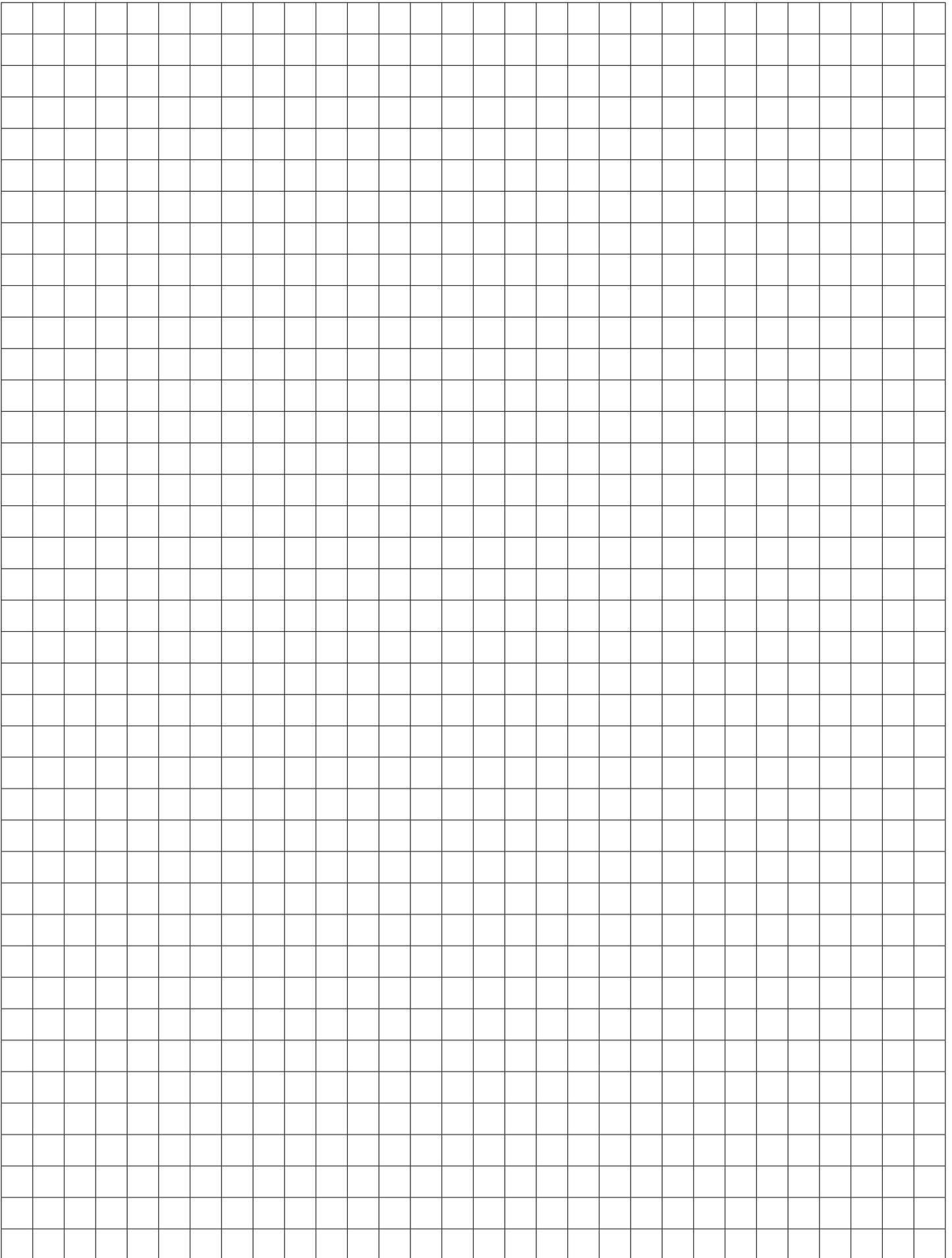
## 14. The Quickest Chef *original source unknown.*

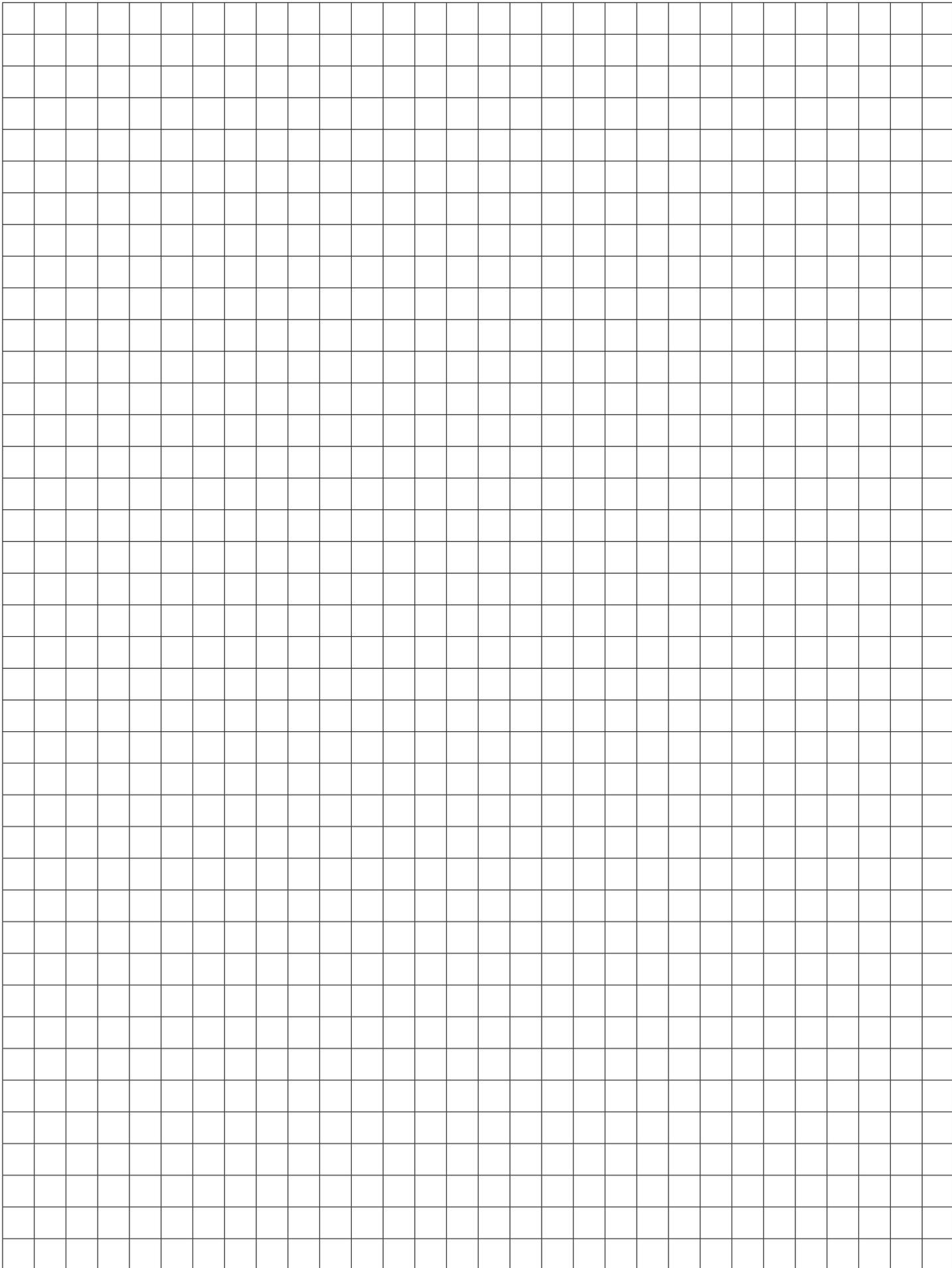
**15. Pizza.** *Recipe reprinted and adapted with permission from:* <https://canolaeatwell.com>

**16. Stained Glass.** *Project Recipe reprinted and adapted with permission from:* <https://canolaeatwell.com>

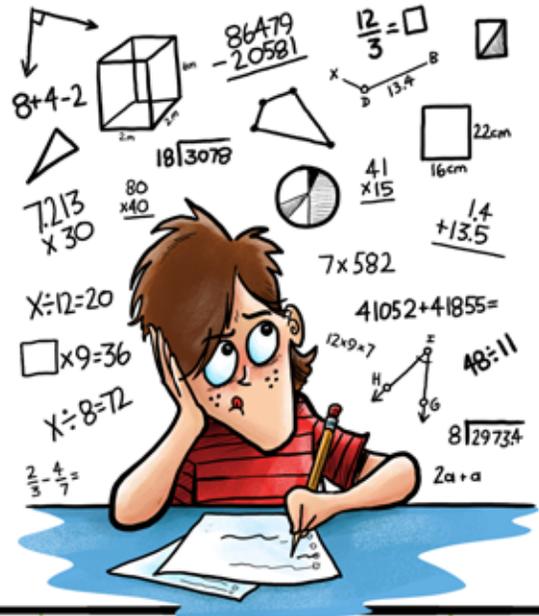
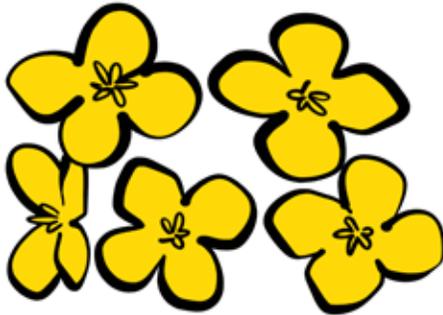
**17. Sugar Cookies.** *Recipe reprinted and adapted with permission from:* <https://canolaeatwell.com>

# Area and Perimeter of a Canola Field





# Chase Duffy's Multiplication Facts...



<b>X</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>1</b>	1	2	3	4	5	6	7	8	9	10	11	12
<b>2</b>	2	4	6	8	10	12	14	16	18	20	22	24
<b>3</b>	3	6	9	12	15	18	21	24	27	30	33	36
<b>4</b>	4	8	12	16	20	24	28	32	36	40	44	48
<b>5</b>	5	10	15	20	25	30	35	40	45	50	55	60
<b>6</b>	6	12	18	24	30	36	42	48	54	60	66	72
<b>7</b>	7	14	21	28	35	42	49	56	63	70	77	84
<b>8</b>	8	16	24	32	40	48	56	64	72	80	88	96
<b>9</b>	9	18	27	36	45	54	63	72	81	90	99	108
<b>10</b>	10	20	30	40	50	60	70	80	90	100	110	120
<b>11</b>	11	22	33	44	55	66	77	88	99	110	121	132
<b>12</b>	12	24	36	48	60	72	84	96	108	120	132	144

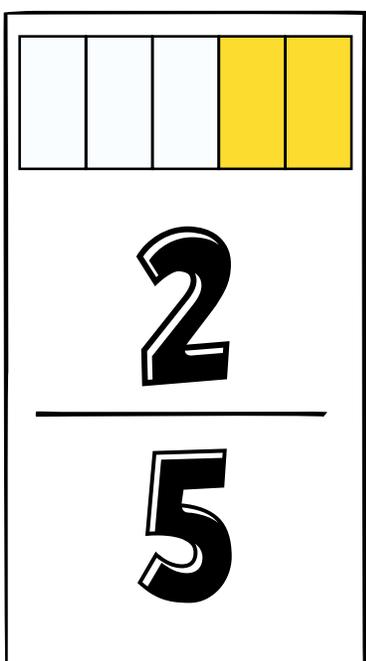
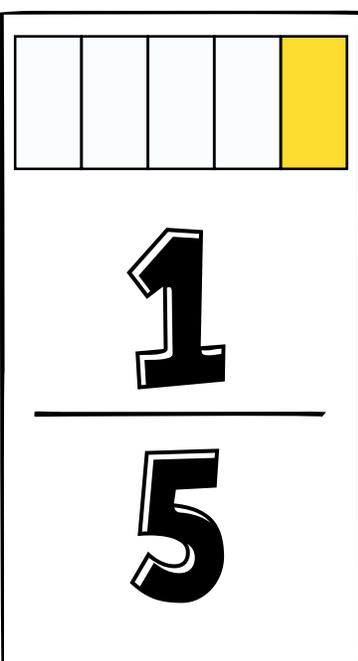
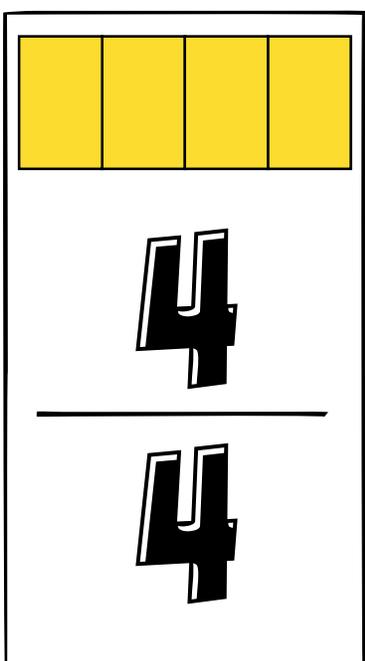
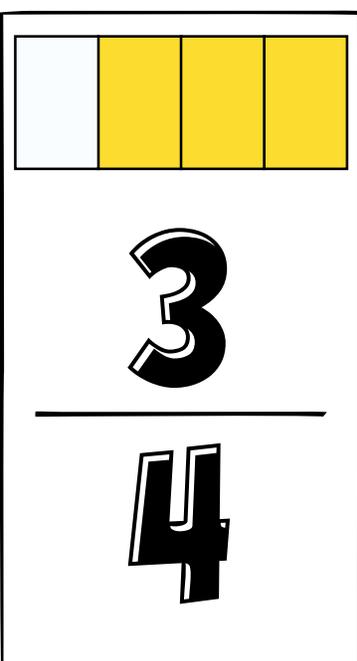
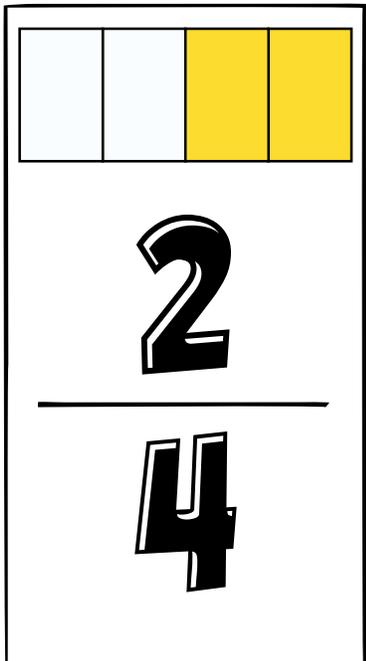
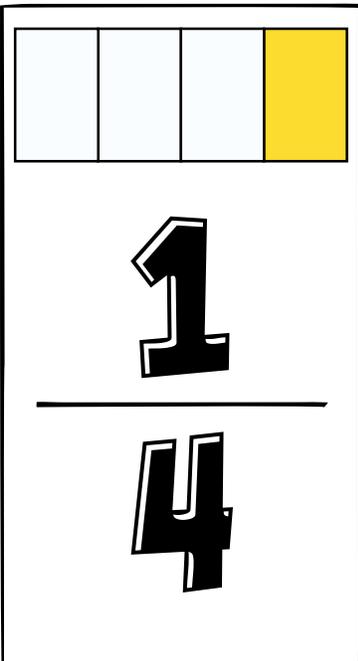
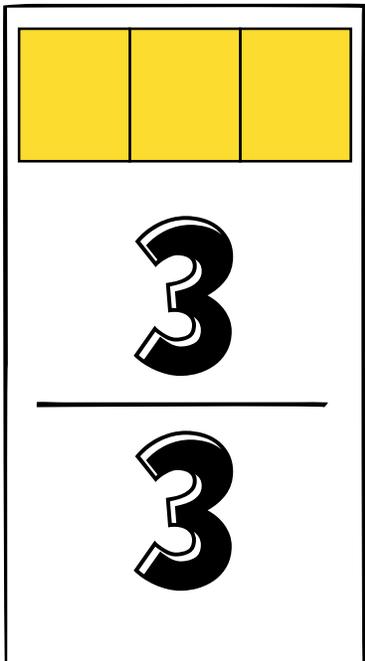
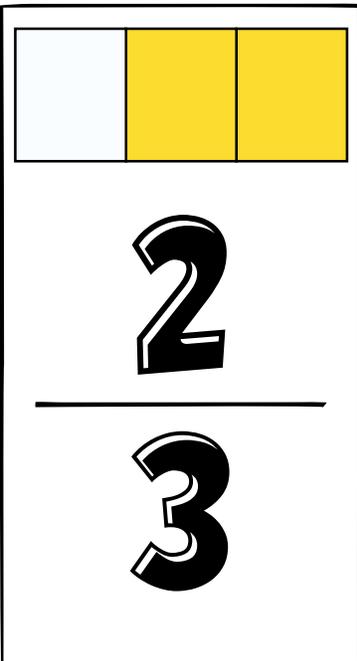
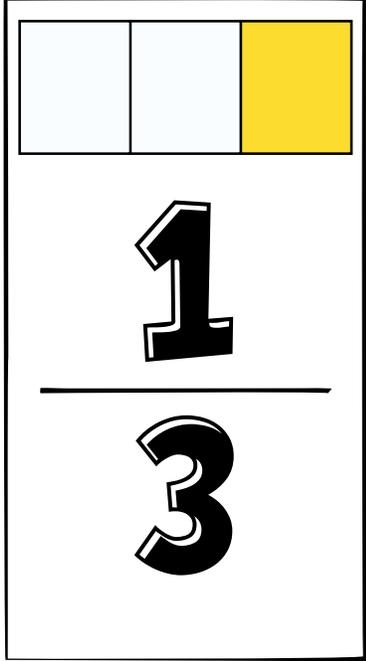
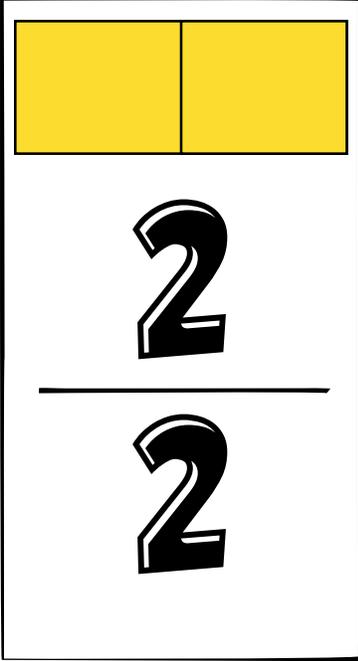
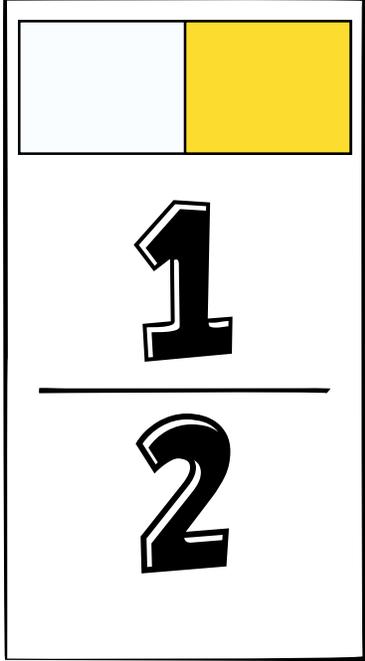
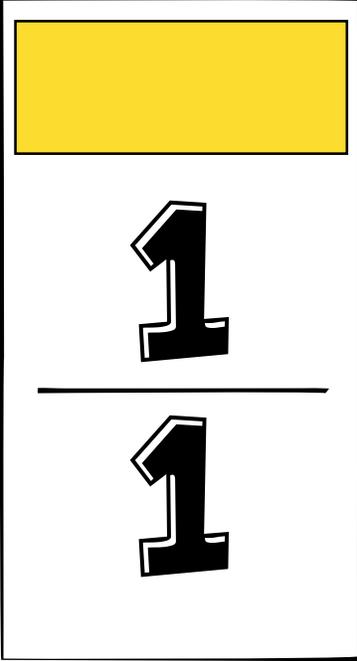
# Doodle Pages



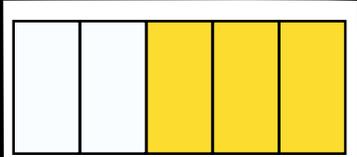
# Doodle Pages







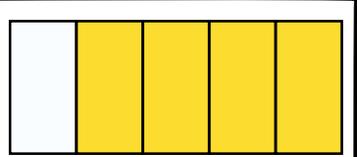




**3**

---

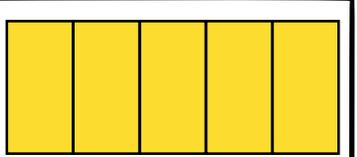
**5**



**4**

---

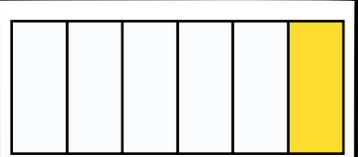
**5**



**5**

---

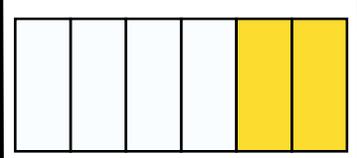
**5**



**1**

---

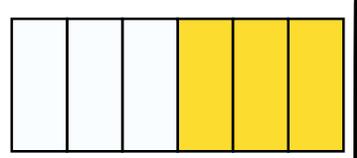
**6**



**2**

---

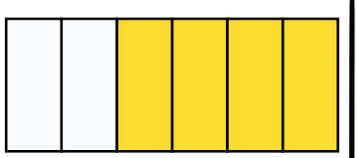
**6**



**3**

---

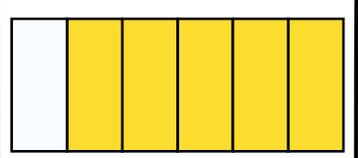
**6**



**4**

---

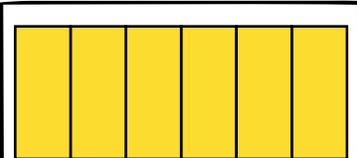
**6**



**5**

---

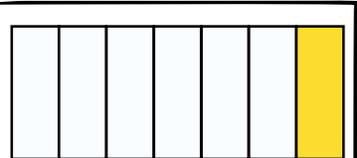
**6**



**6**

---

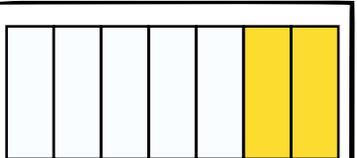
**6**



**1**

---

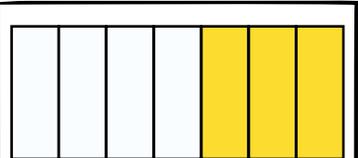
**7**



**2**

---

**7**

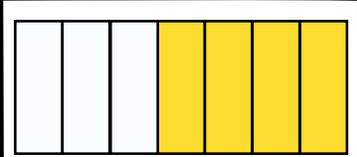


**3**

---

**7**

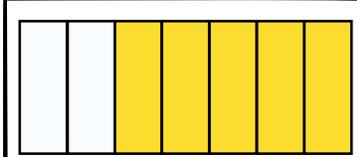




**4**



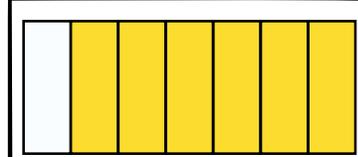
**7**



**5**



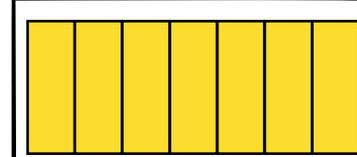
**7**



**6**



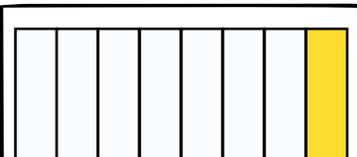
**7**



**7**



**7**



**1**



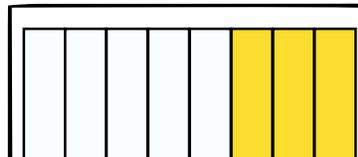
**8**



**2**



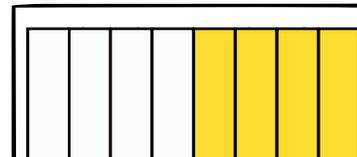
**8**



**3**



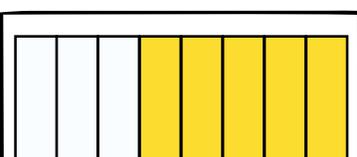
**8**



**4**



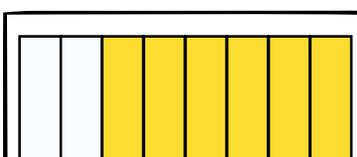
**8**



**5**



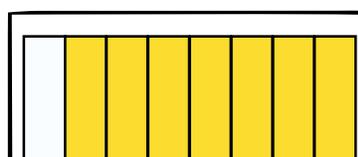
**8**



**6**



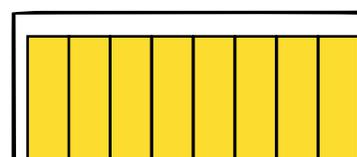
**8**



**7**



**8**

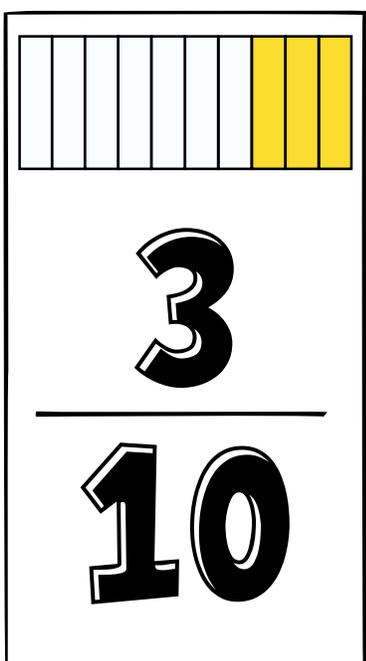
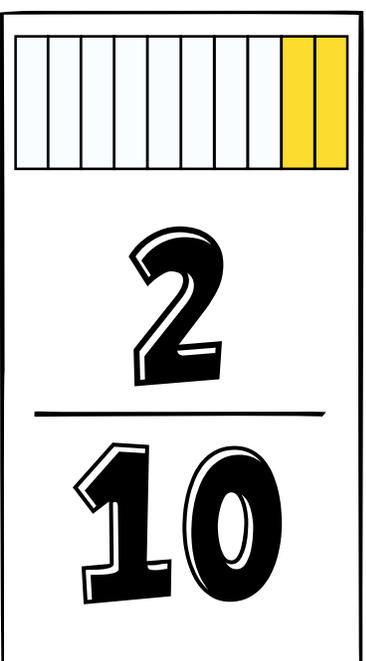
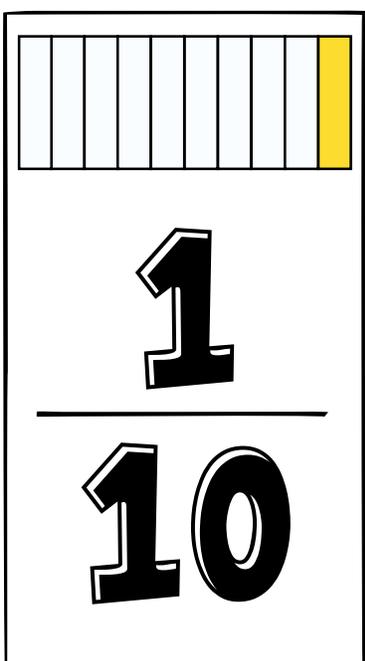
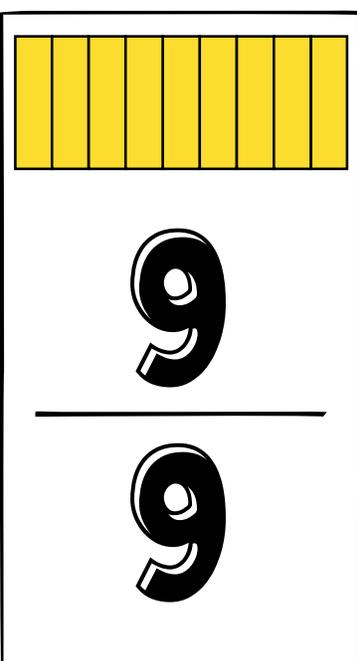
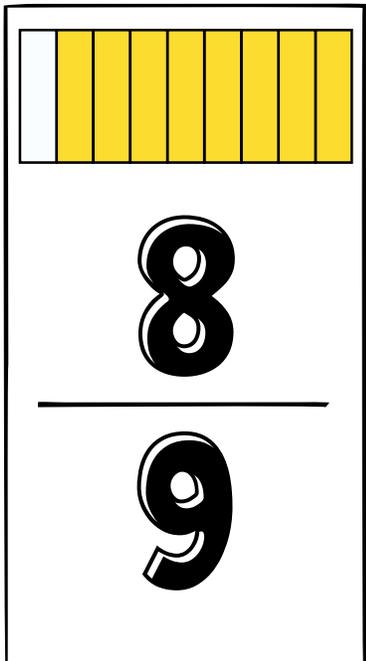
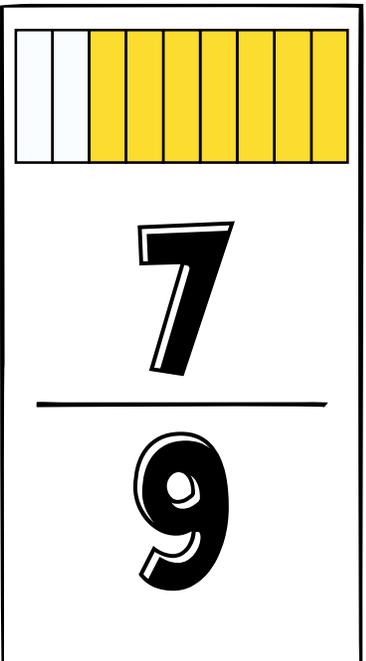
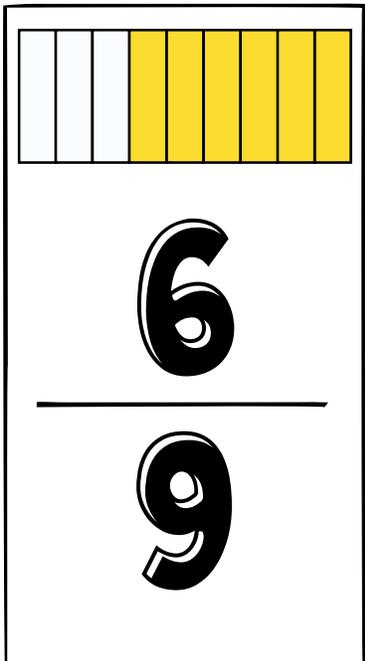
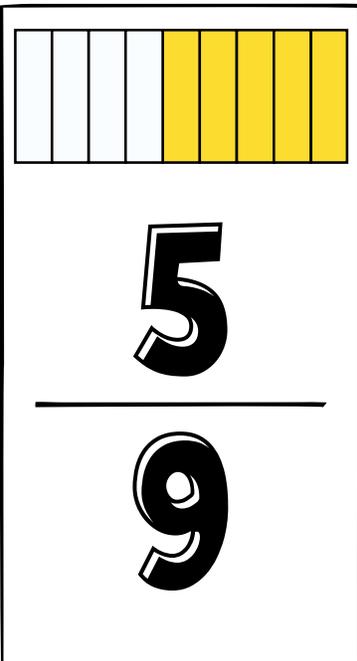
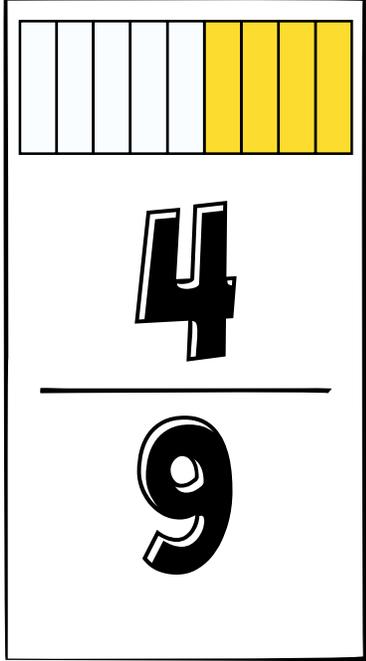
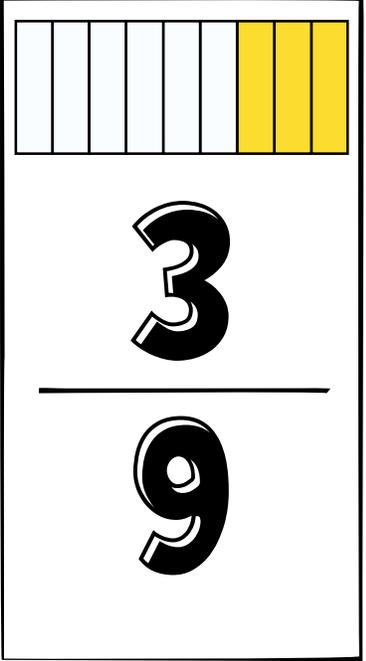
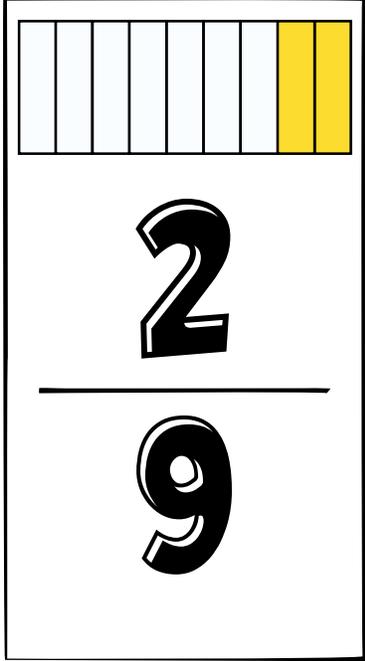
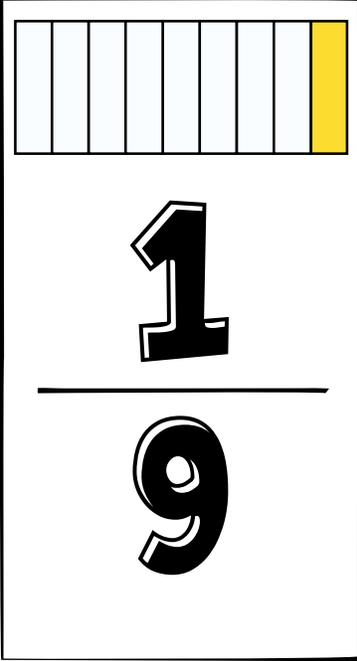


**8**

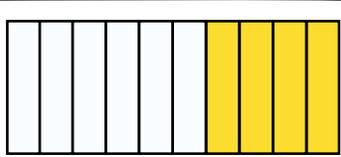


**8**





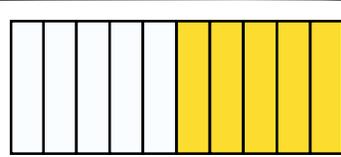




**4**

---

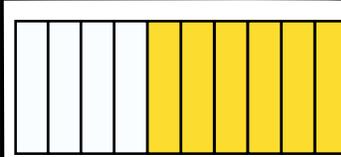
**10**



**5**

---

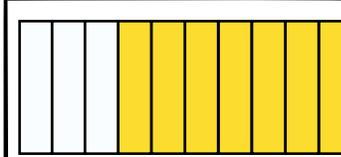
**10**



**6**

---

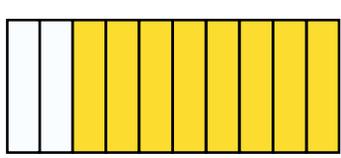
**10**



**7**

---

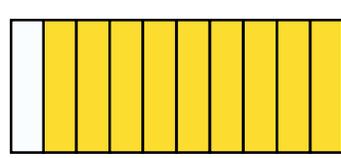
**10**



**8**

---

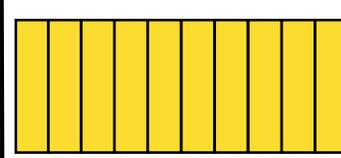
**10**



**9**

---

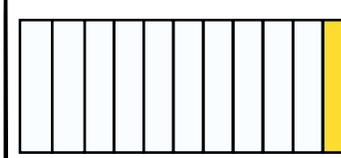
**10**



**10**

---

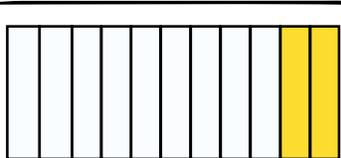
**10**



**1**

---

**11**



**2**

---

**11**



**3**

---

**11**



**4**

---

**11**

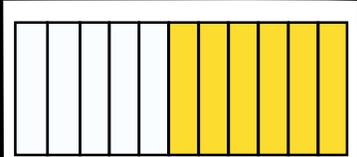


**5**

---

**11**

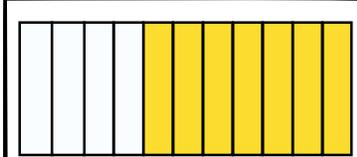




**6**

---

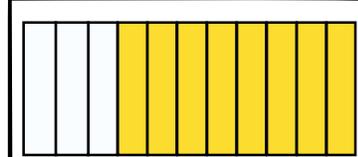
**11**



**7**

---

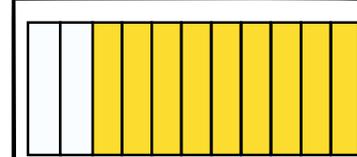
**11**



**8**

---

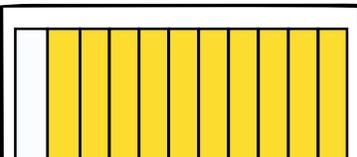
**11**



**9**

---

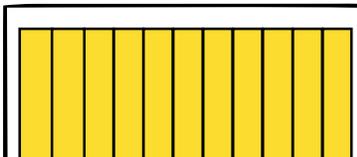
**11**



**10**

---

**11**



**11**

---

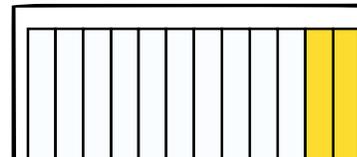
**11**



**1**

---

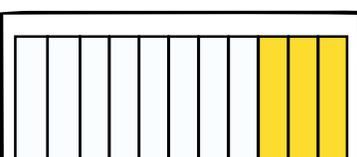
**12**



**2**

---

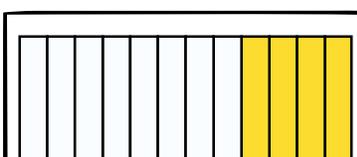
**12**



**3**

---

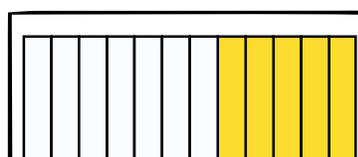
**12**



**4**

---

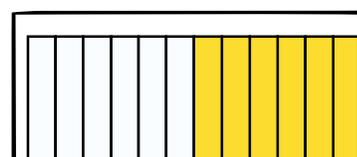
**12**



**5**

---

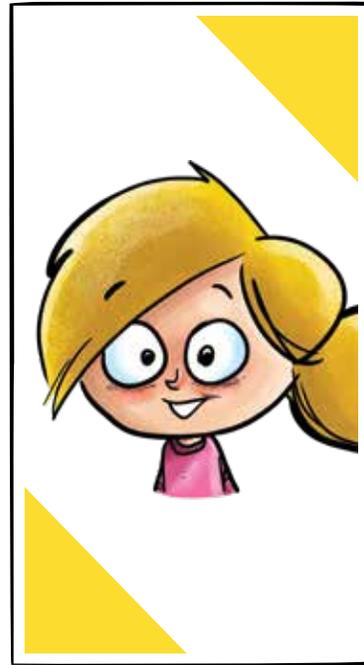
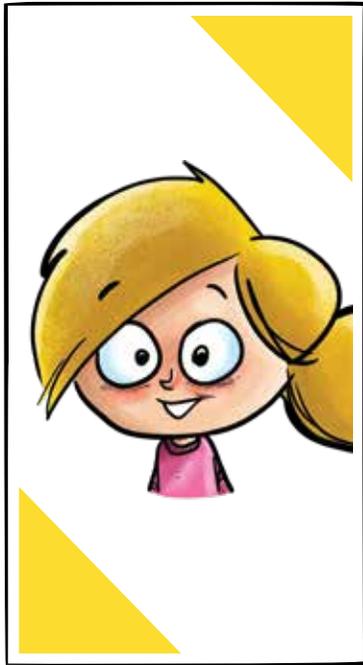
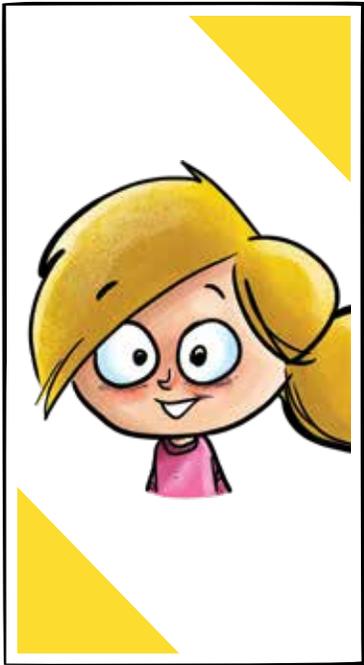
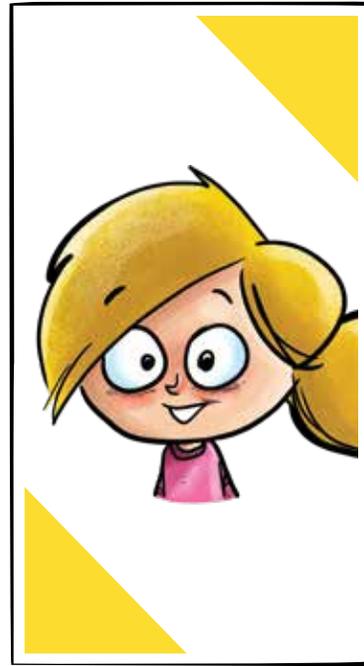
**12**

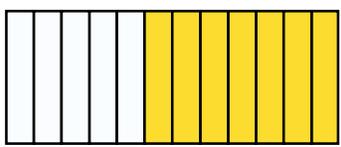


**6**

---

**12**

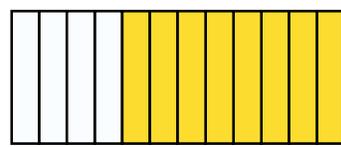




**7**

---

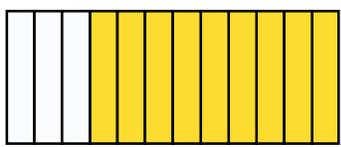
**12**



**8**

---

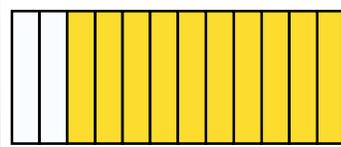
**12**



**9**

---

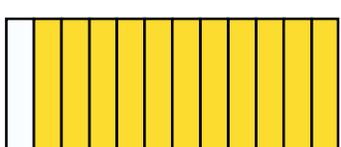
**12**



**10**

---

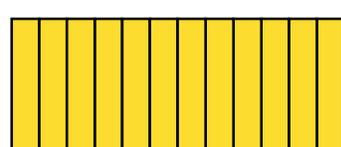
**12**



**11**

---

**12**



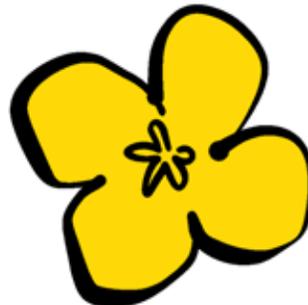
**12**

---

**12**

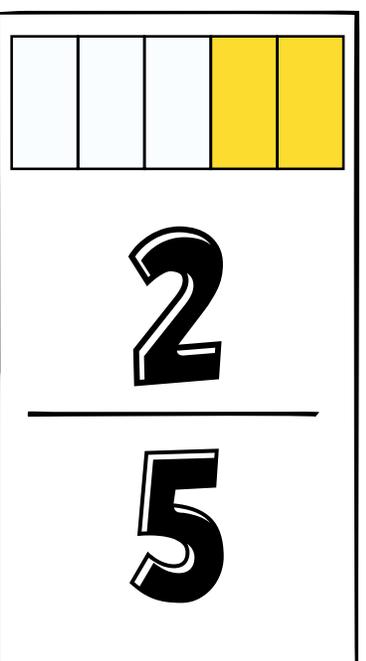
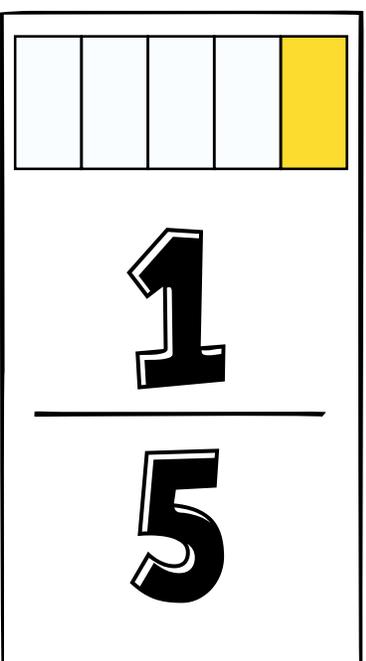
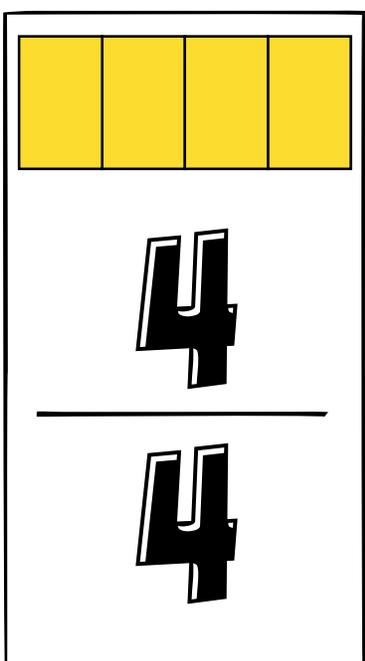
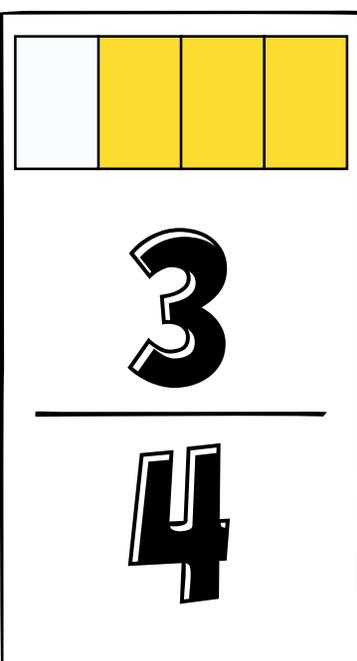
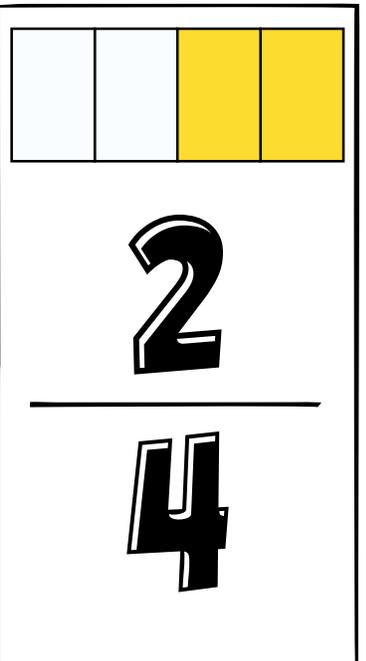
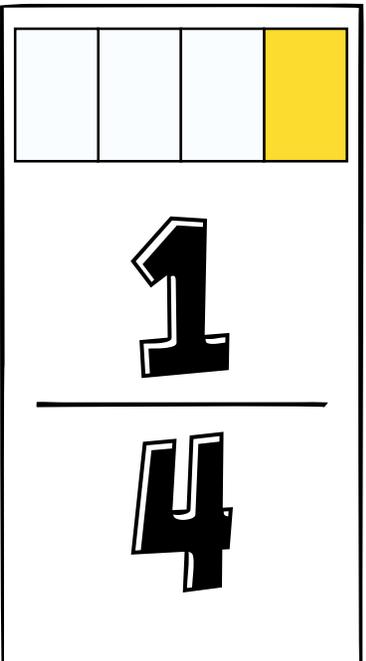
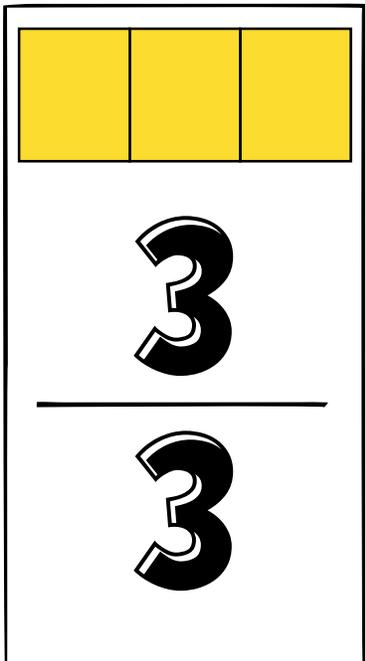
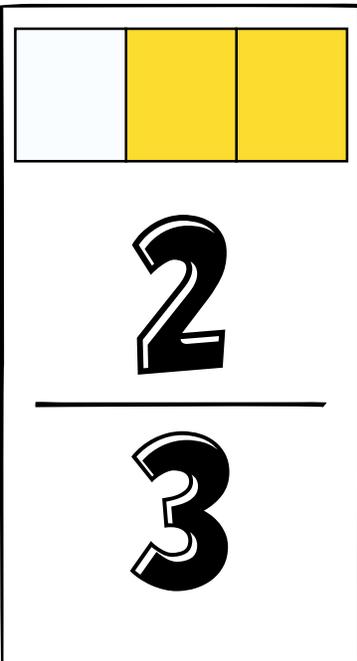
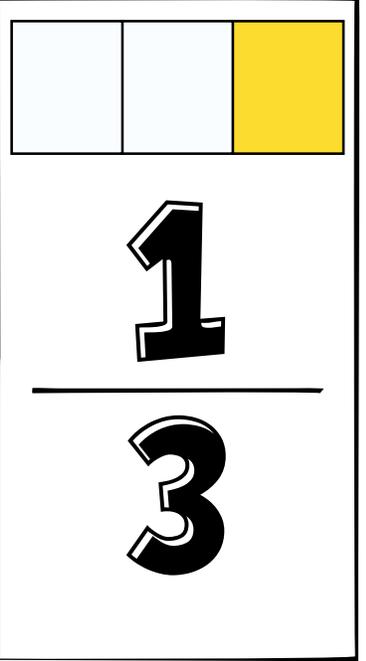
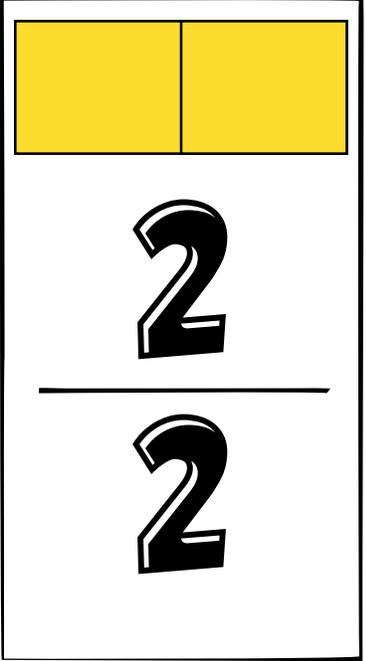
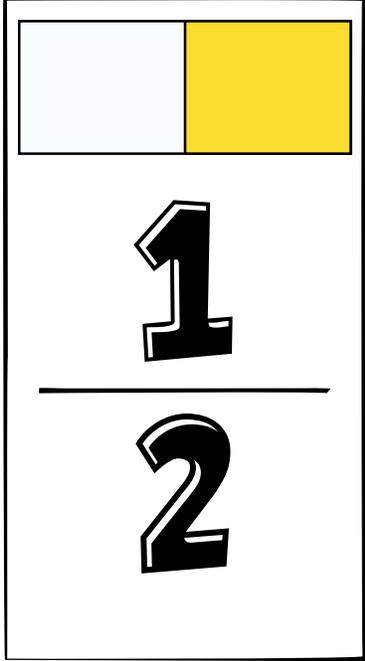
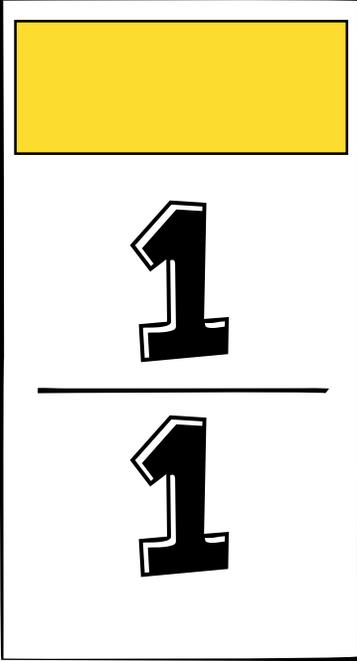


**WILD  
CARD**

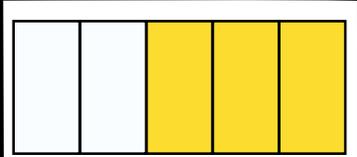


**WILD  
CARD**





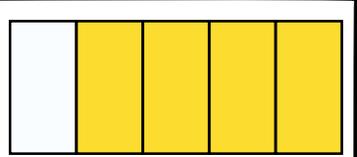




**3**

---

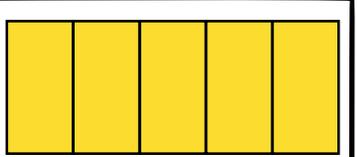
**5**



**4**

---

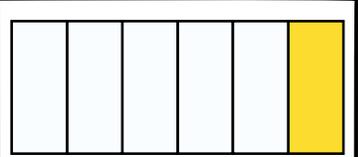
**5**



**5**

---

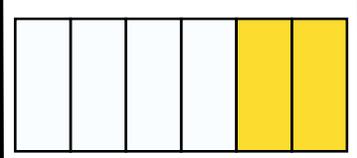
**5**



**1**

---

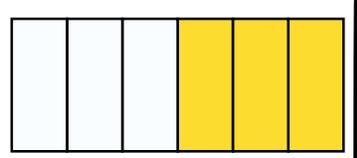
**6**



**2**

---

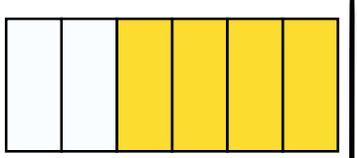
**6**



**3**

---

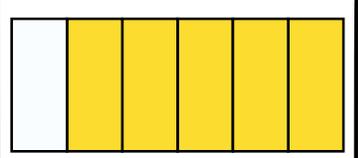
**6**



**4**

---

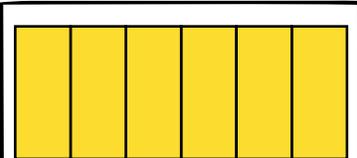
**6**



**5**

---

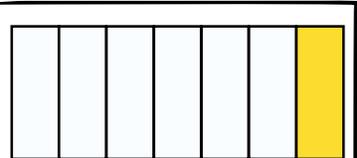
**6**



**6**

---

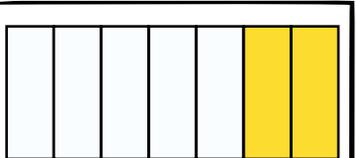
**6**



**1**

---

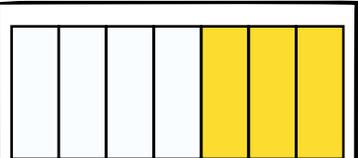
**7**



**2**

---

**7**

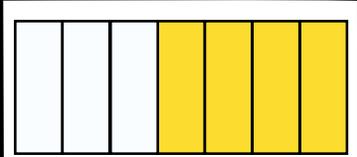


**3**

---

**7**

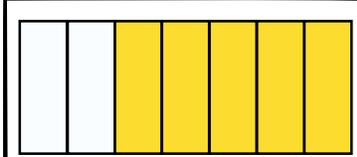




**4**



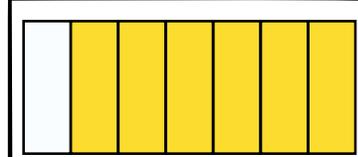
**7**



**5**



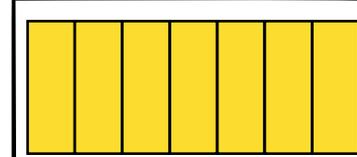
**7**



**6**



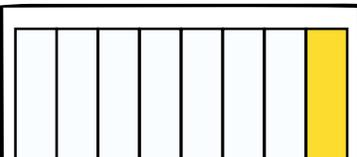
**7**



**7**



**7**



**1**



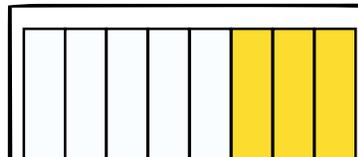
**8**



**2**



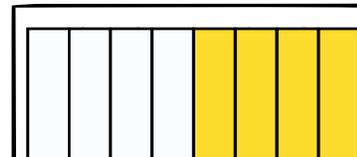
**8**



**3**



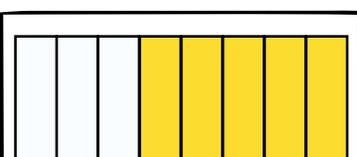
**8**



**4**



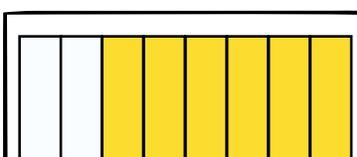
**8**



**5**



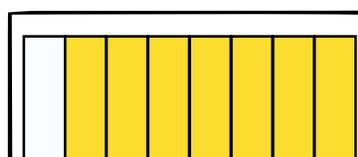
**8**



**6**



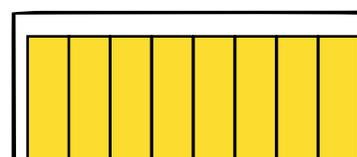
**8**



**7**



**8**

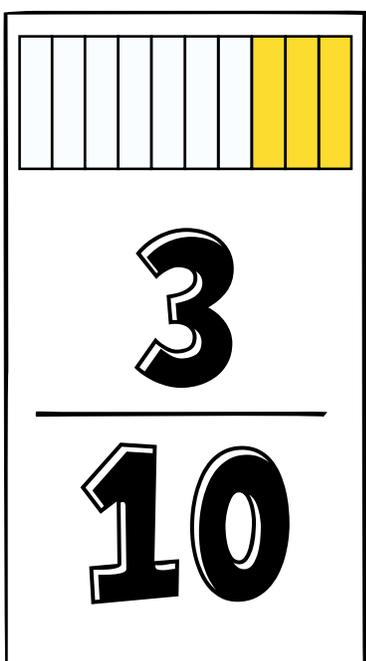
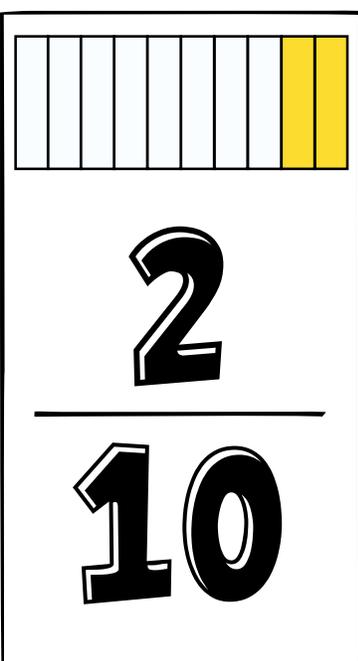
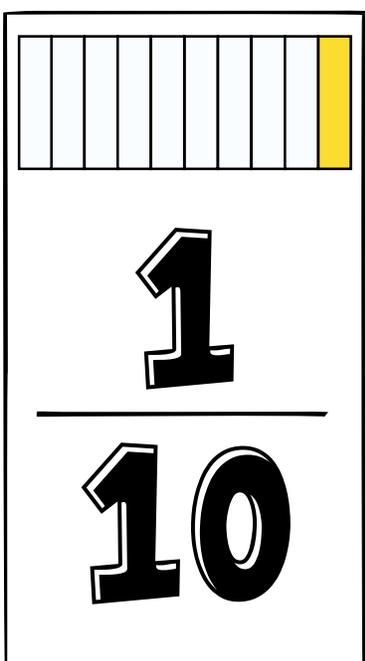
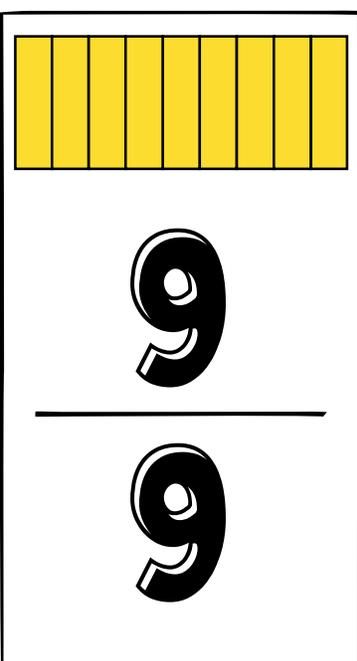
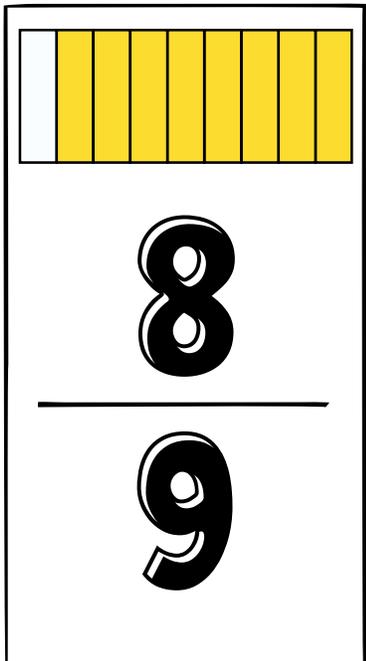
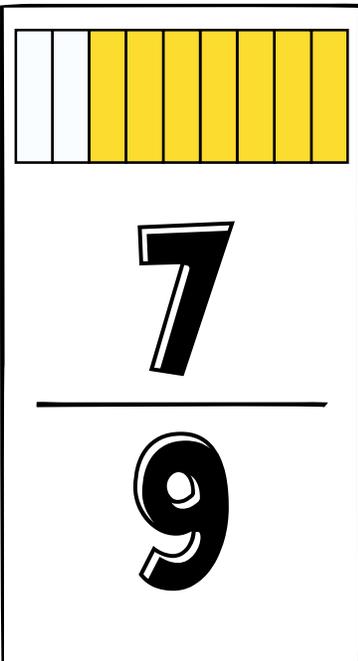
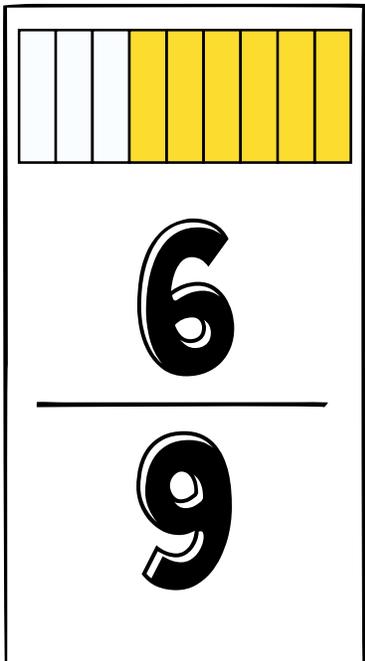
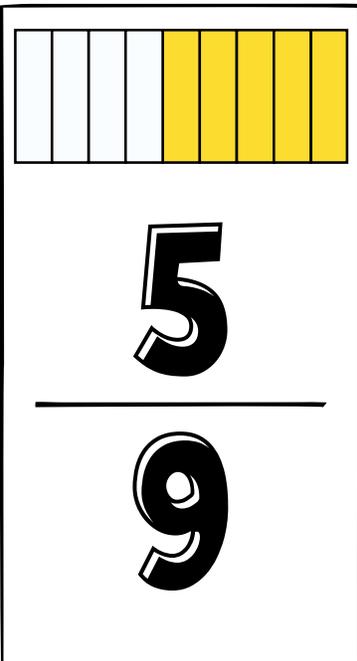
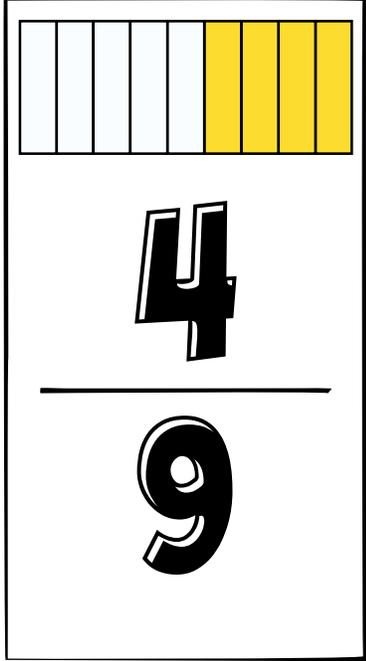
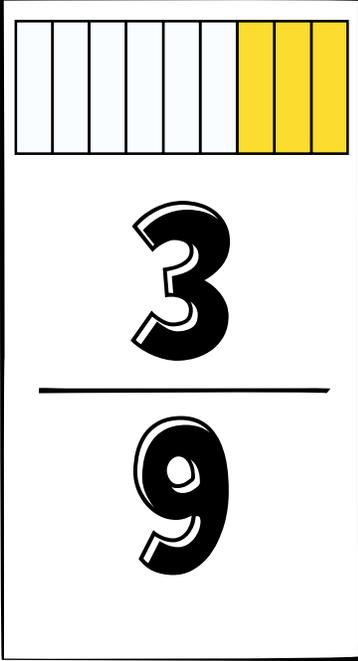
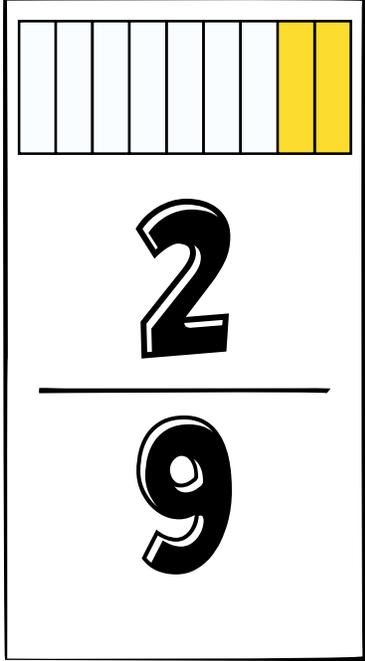
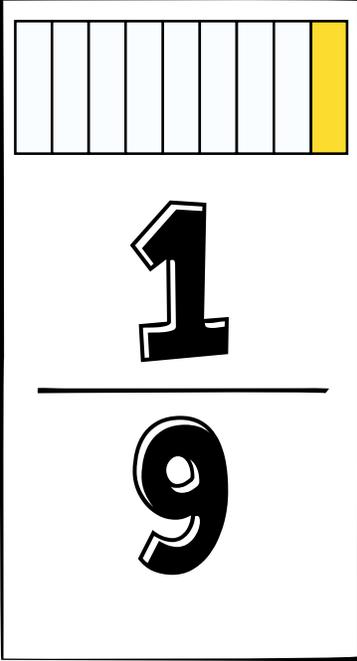


**8**

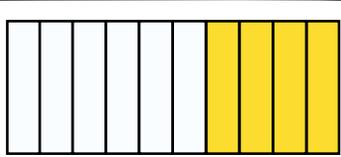


**8**





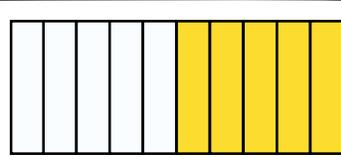




**4**

---

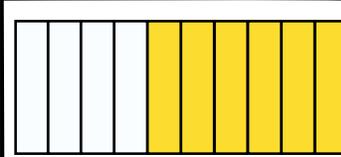
**10**



**5**

---

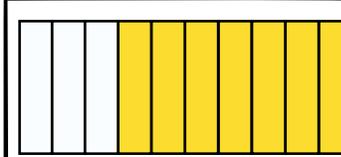
**10**



**6**

---

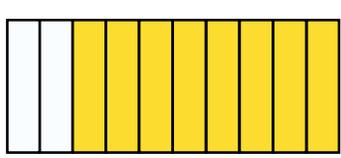
**10**



**7**

---

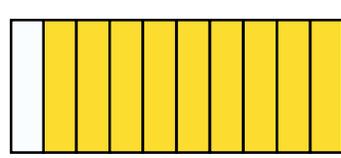
**10**



**8**

---

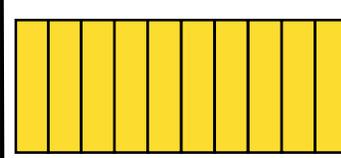
**10**



**9**

---

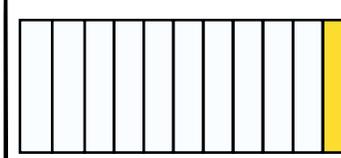
**10**



**10**

---

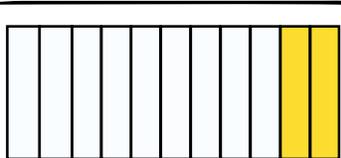
**10**



**1**

---

**11**



**2**

---

**11**



**3**

---

**11**



**4**

---

**11**

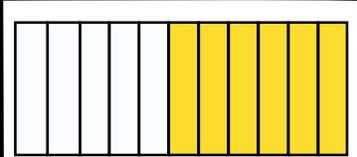


**5**

---

**11**

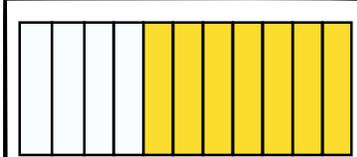




**6**

---

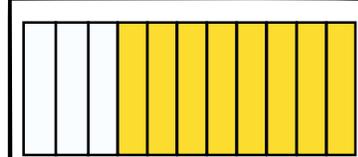
**11**



**7**

---

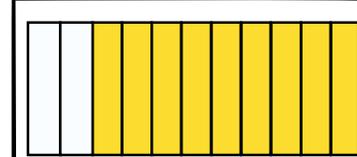
**11**



**8**

---

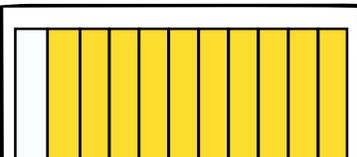
**11**



**9**

---

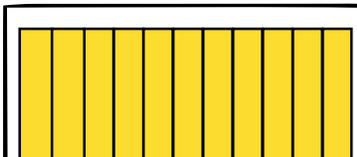
**11**



**10**

---

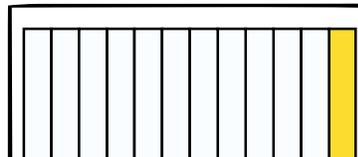
**11**



**11**

---

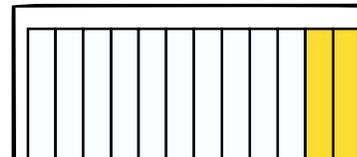
**11**



**1**

---

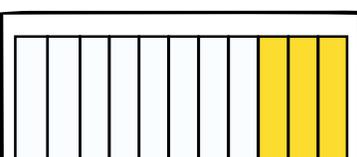
**12**



**2**

---

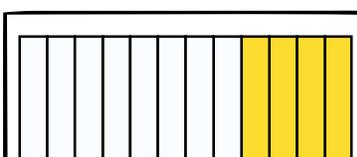
**12**



**3**

---

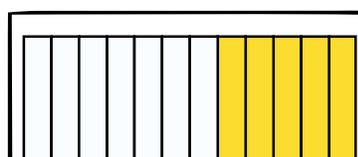
**12**



**4**

---

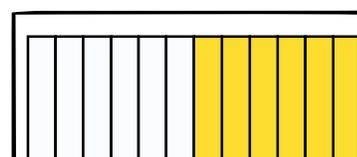
**12**



**5**

---

**12**

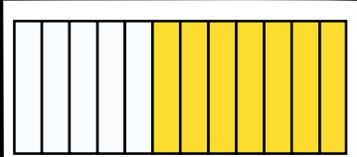


**6**

---

**12**

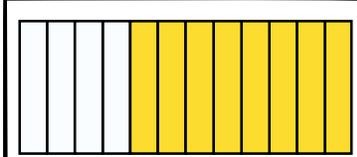




**7**

---

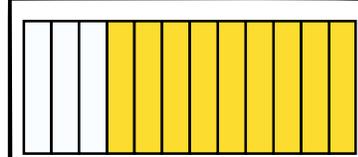
**12**



**8**

---

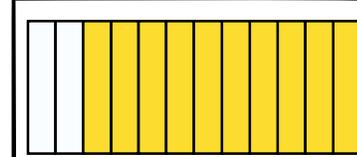
**12**



**9**

---

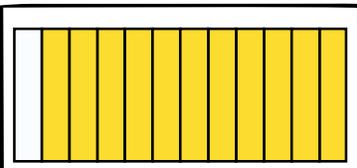
**12**



**10**

---

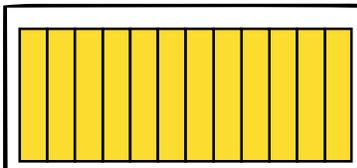
**12**



**11**

---

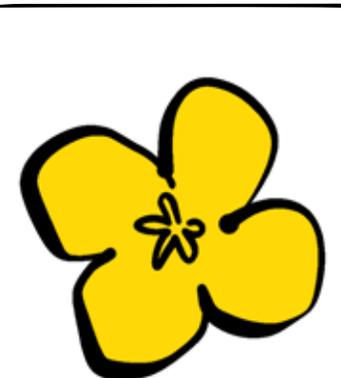
**12**



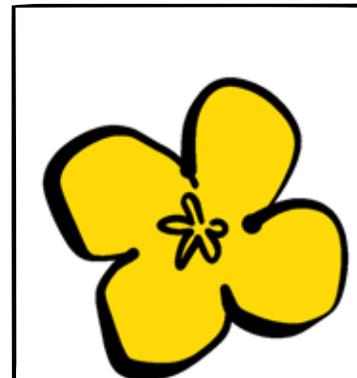
**12**

---

**12**

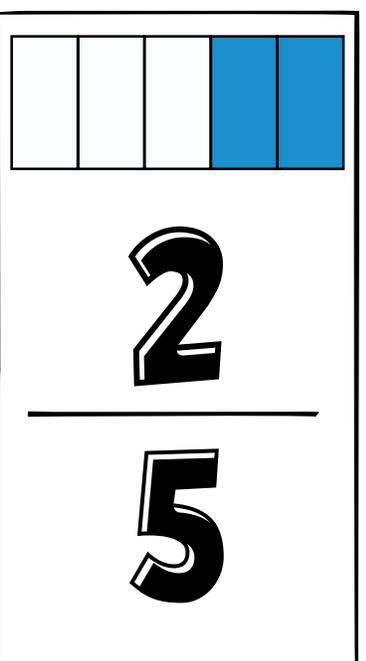
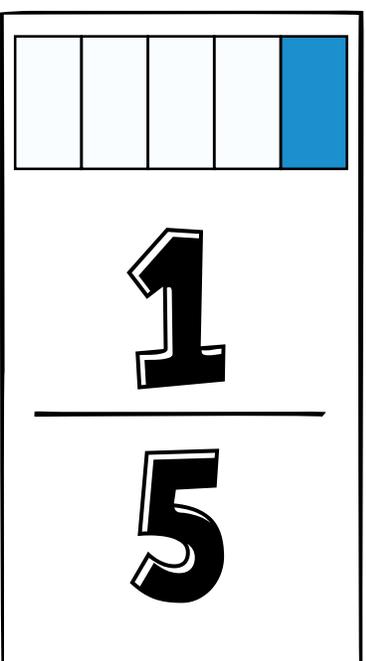
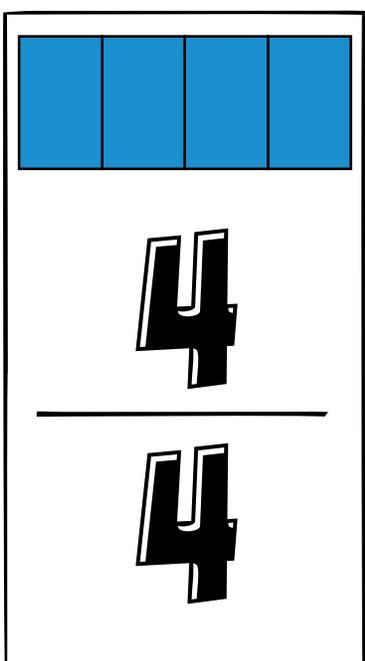
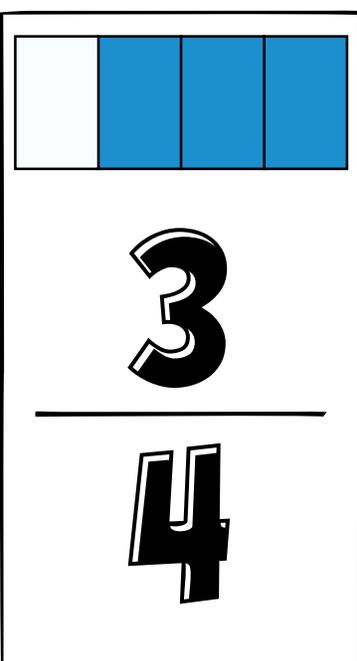
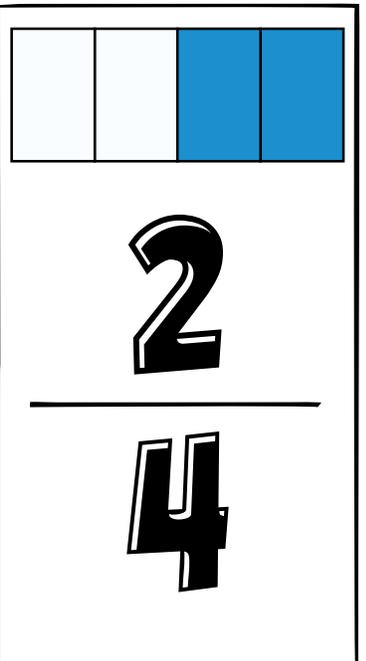
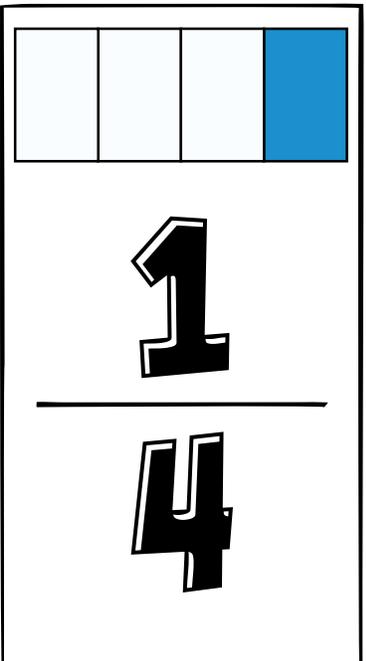
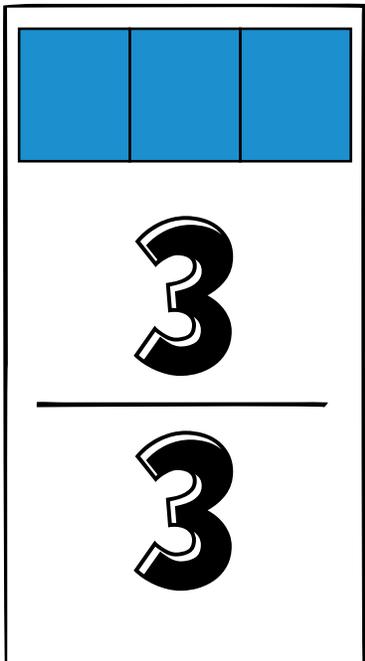
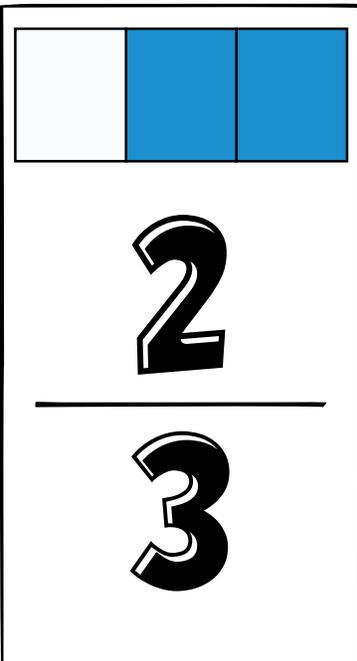
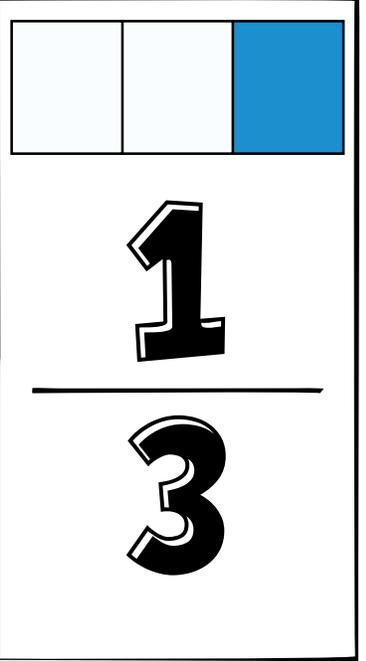
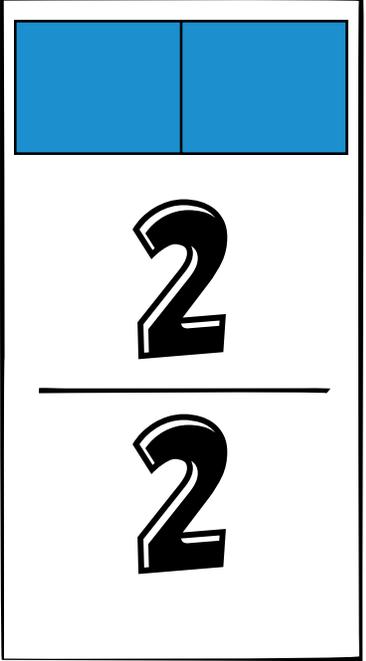
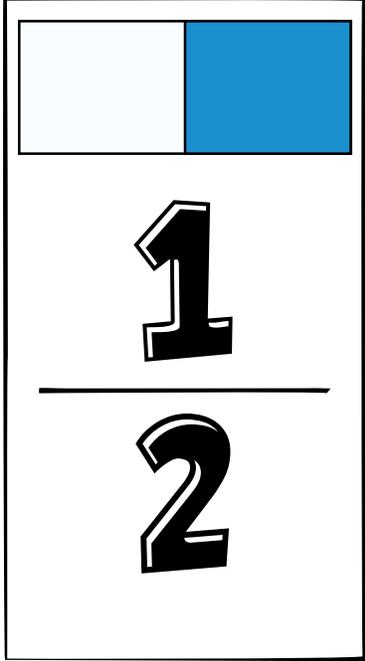
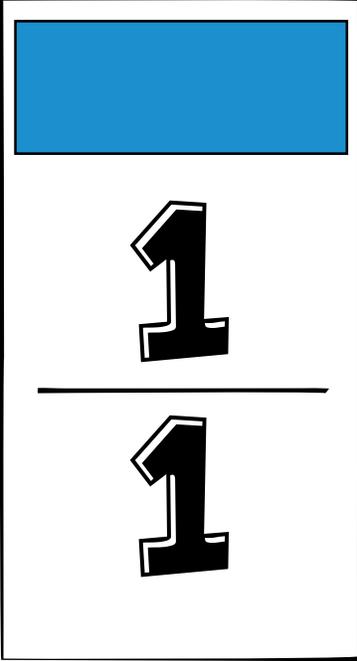


**WILD  
CARD**

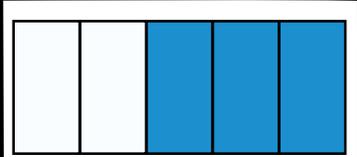


**WILD  
CARD**





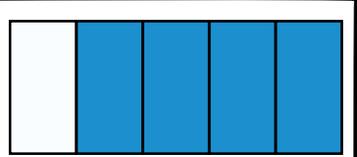




**3**

---

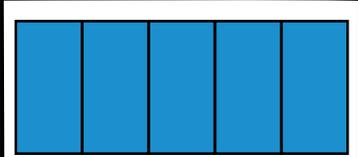
**5**



**4**

---

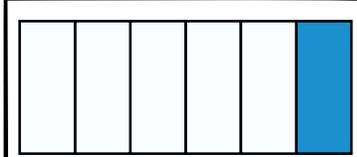
**5**



**5**

---

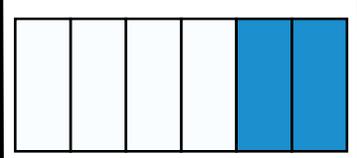
**5**



**1**

---

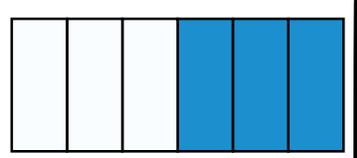
**6**



**2**

---

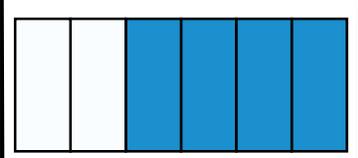
**6**



**3**

---

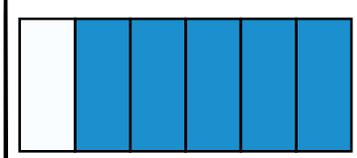
**6**



**4**

---

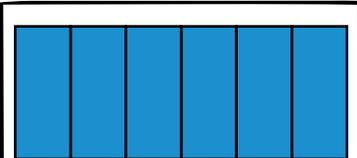
**6**



**5**

---

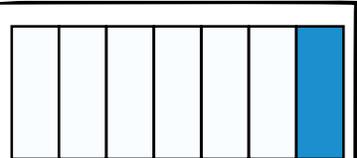
**6**



**6**

---

**6**



**1**

---

**7**



**2**

---

**7**

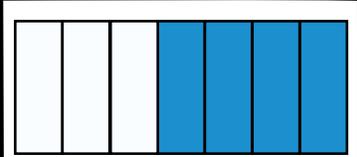


**3**

---

**7**

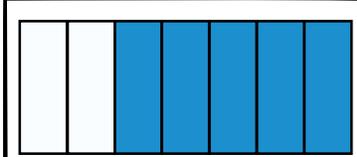




**4**



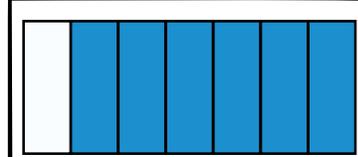
**7**



**5**



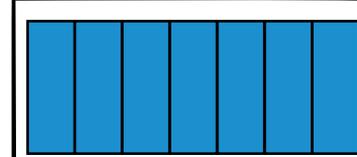
**7**



**6**



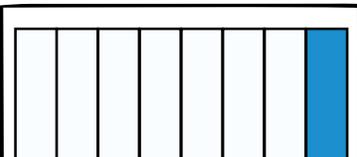
**7**



**7**



**7**



**1**



**8**



**2**



**8**



**3**



**8**



**4**



**8**



**5**



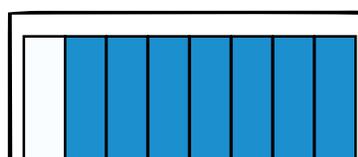
**8**



**6**



**8**



**7**



**8**

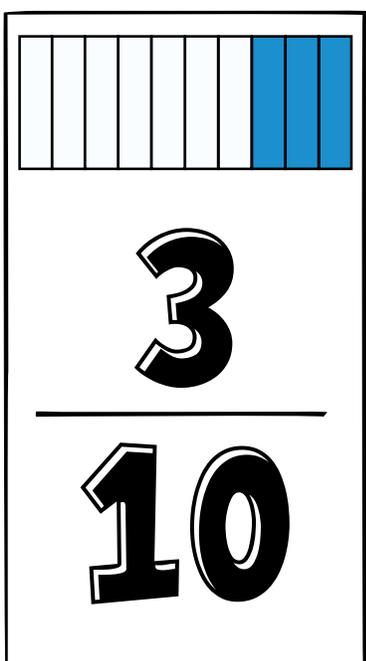
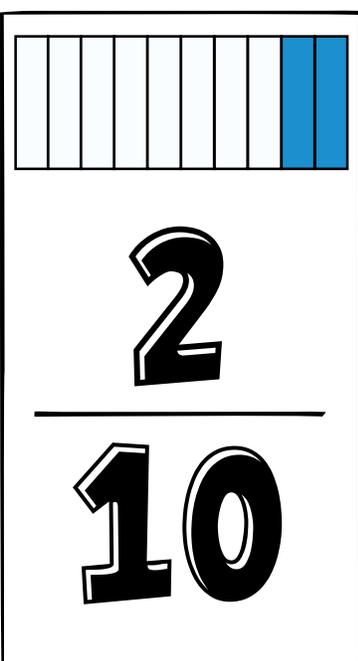
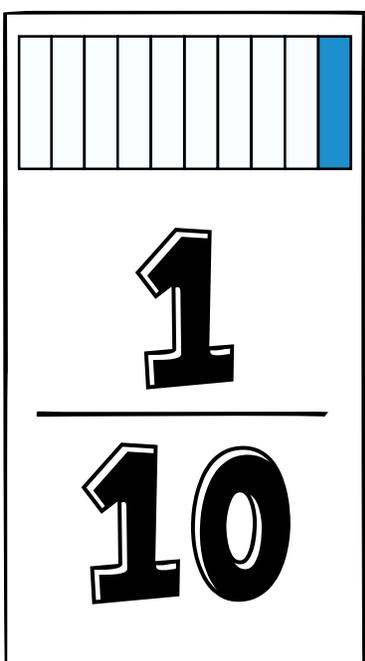
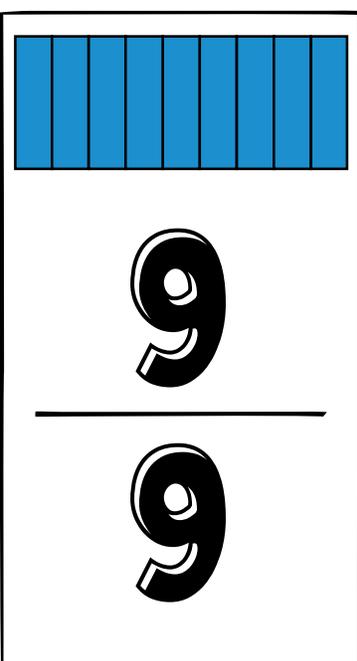
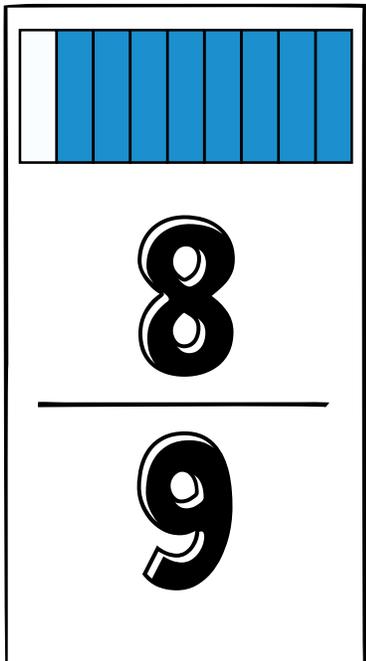
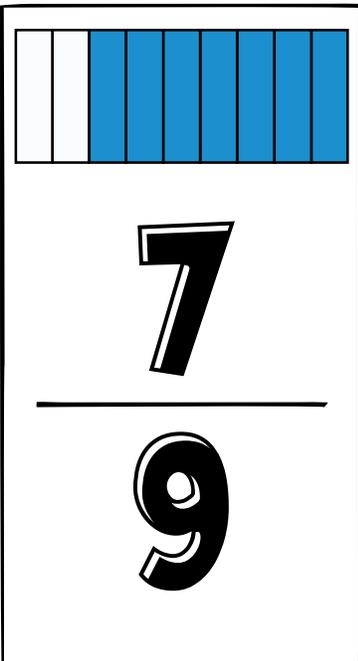
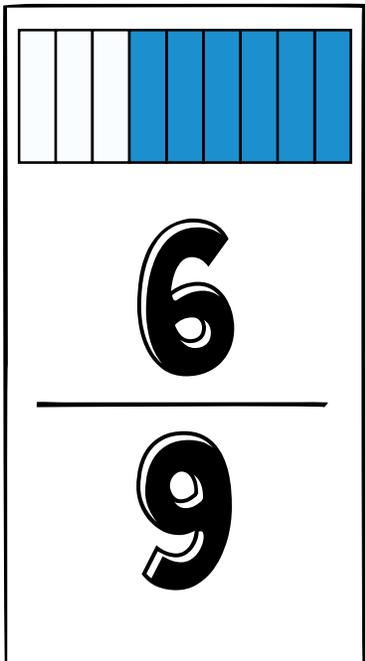
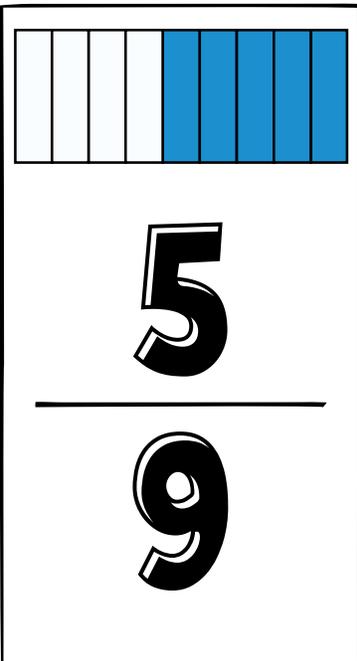
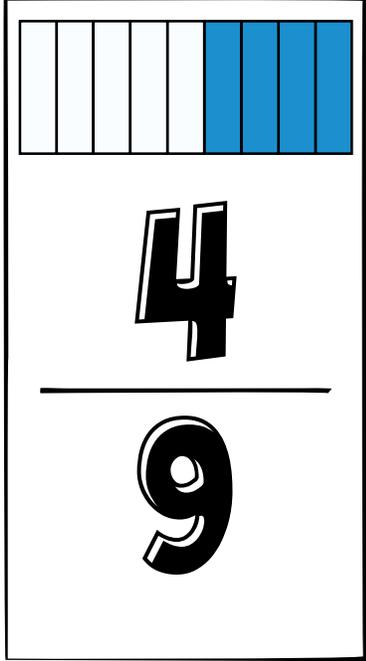
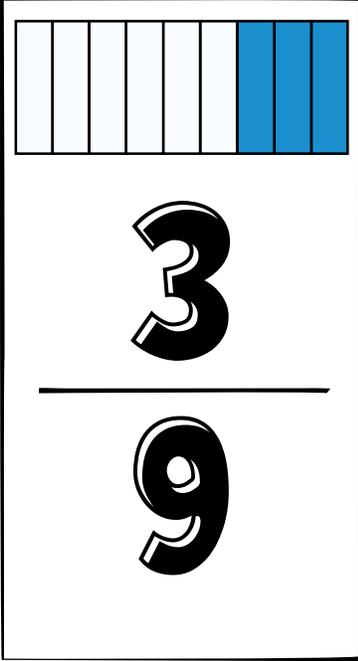
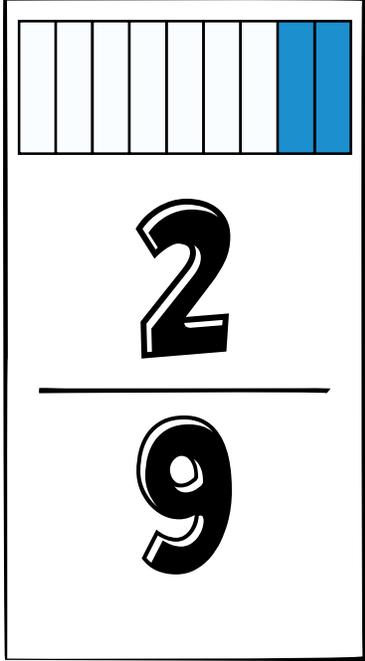
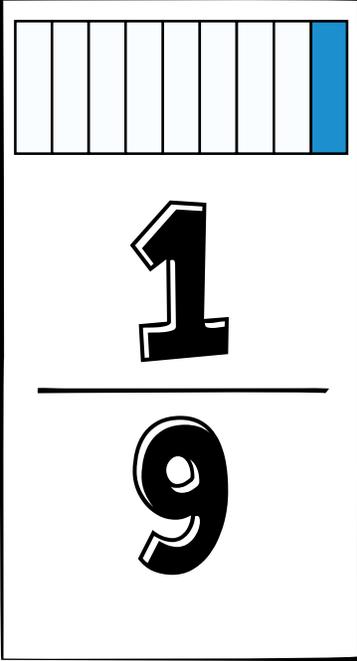


**8**

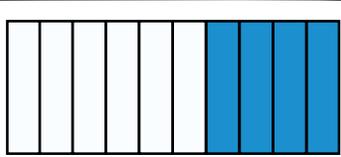


**8**





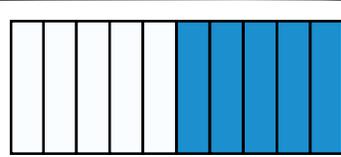




**4**

---

**10**



**5**

---

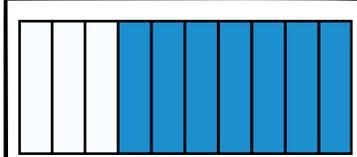
**10**



**6**

---

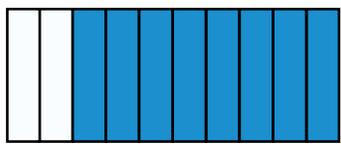
**10**



**7**

---

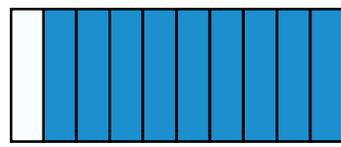
**10**



**8**

---

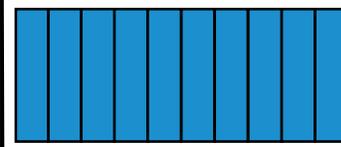
**10**



**9**

---

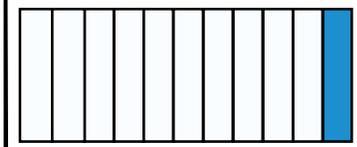
**10**



**10**

---

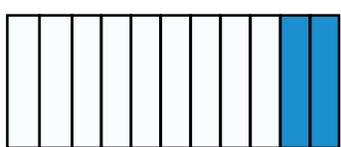
**10**



**1**

---

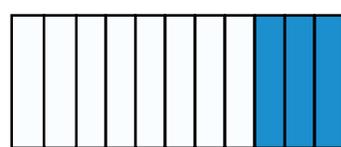
**11**



**2**

---

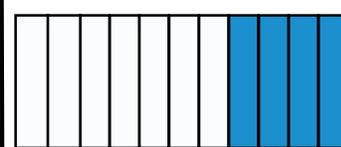
**11**



**3**

---

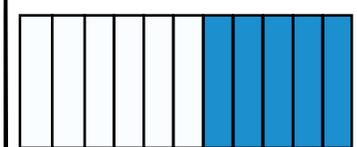
**11**



**4**

---

**11**

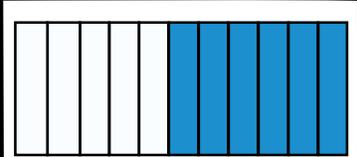


**5**

---

**11**





**6**

---

**11**



**7**

---

**11**



**8**

---

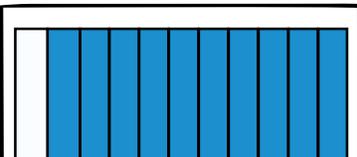
**11**



**9**

---

**11**



**10**

---

**11**



**11**

---

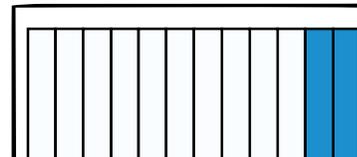
**11**



**1**

---

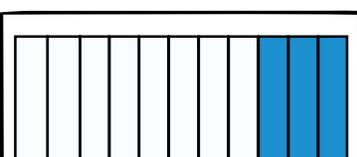
**12**



**2**

---

**12**



**3**

---

**12**



**4**

---

**12**



**5**

---

**12**



**6**

---

**12**

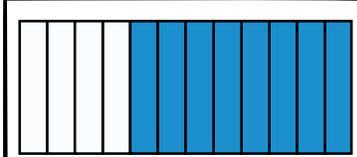




**7**

---

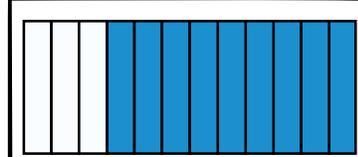
**12**



**8**

---

**12**



**9**

---

**12**



**10**

---

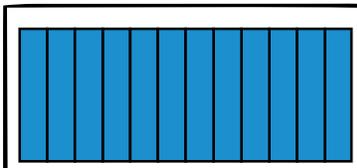
**12**



**11**

---

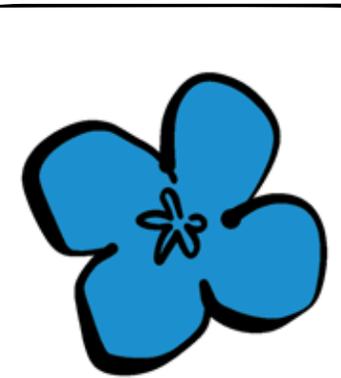
**12**



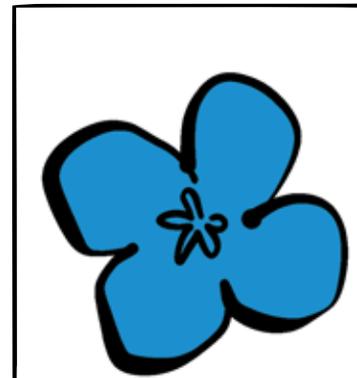
**12**

---

**12**

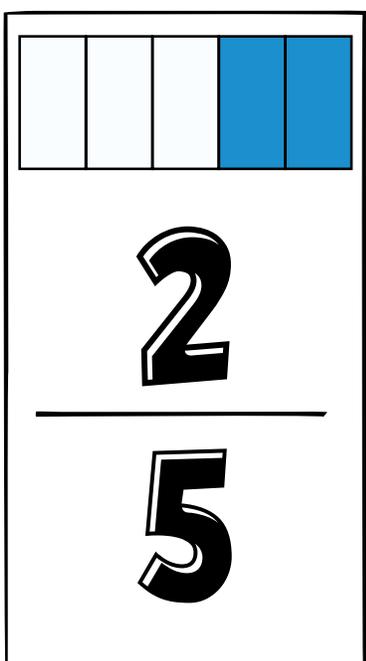
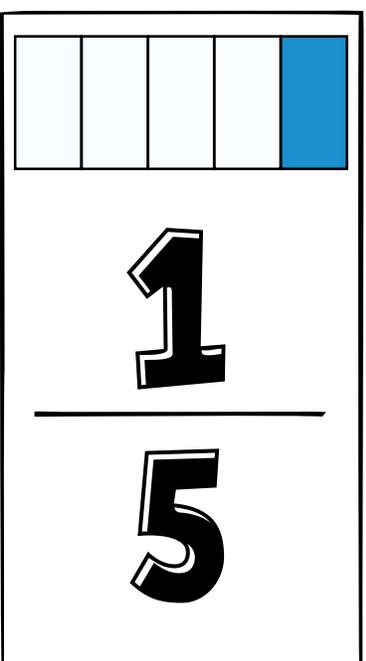
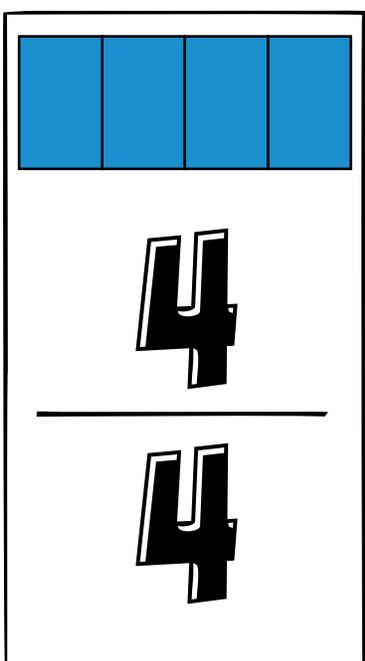
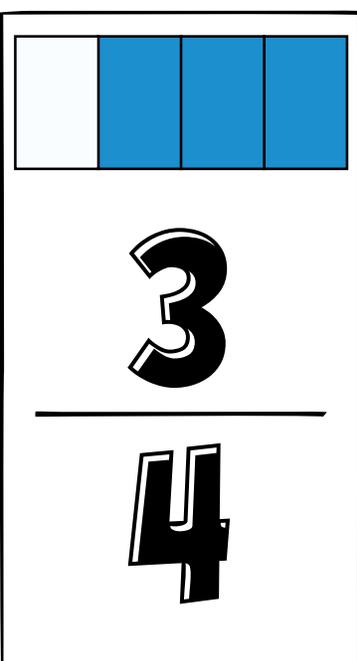
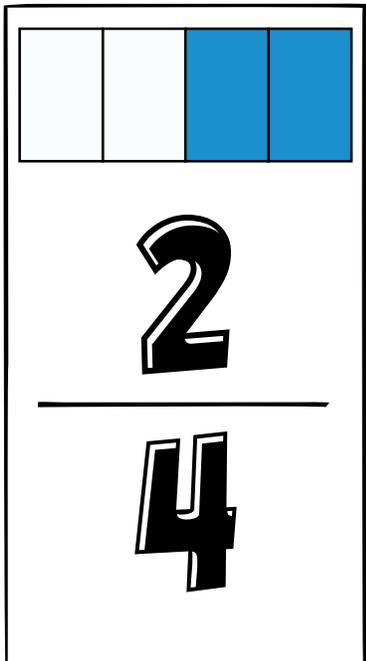
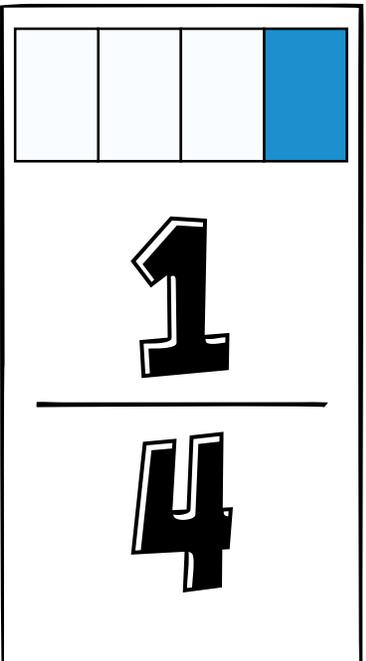
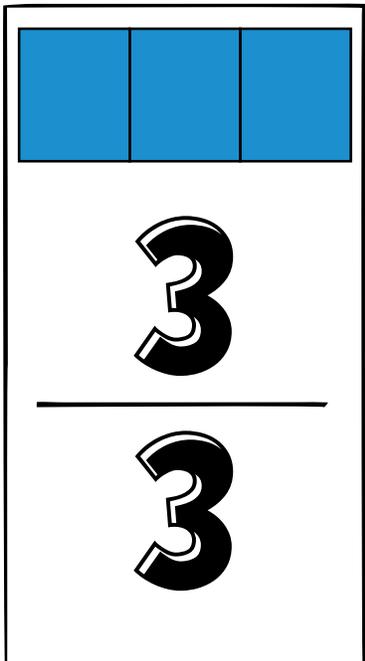
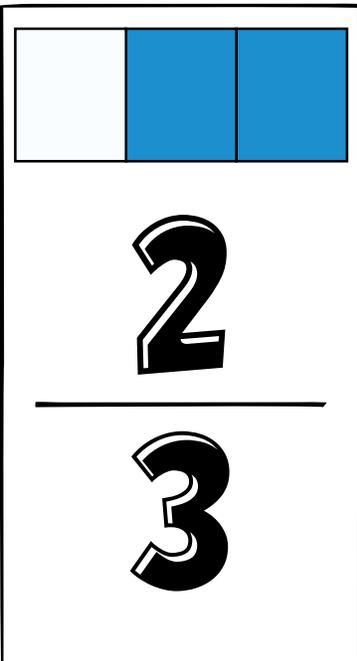
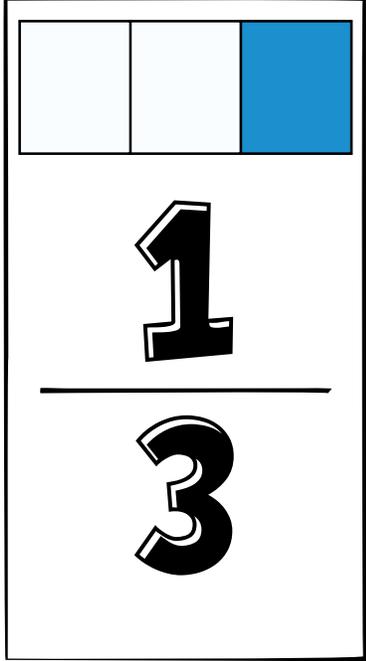
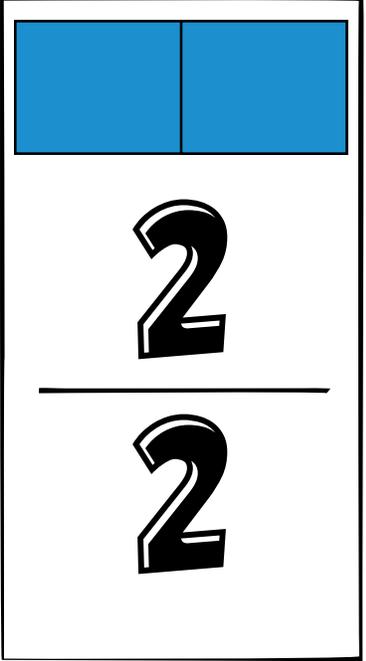
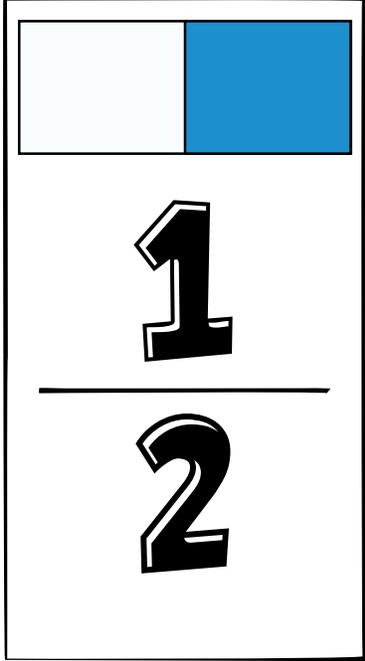
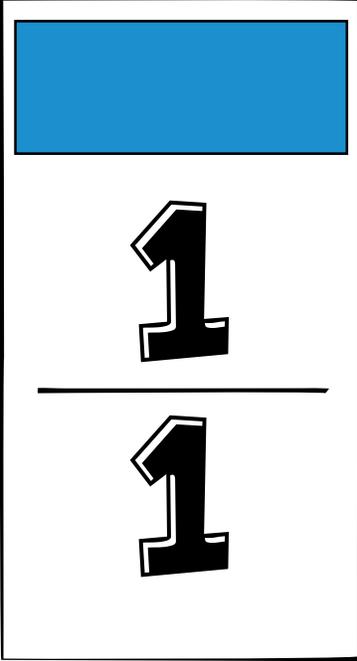


**WILD  
CARD**

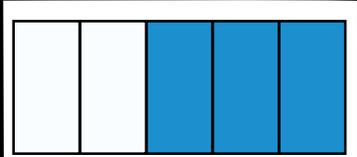


**WILD  
CARD**





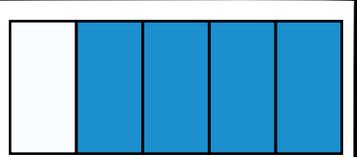




**3**

---

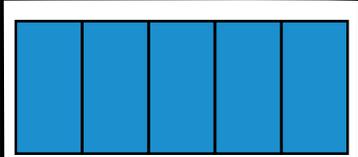
**5**



**4**

---

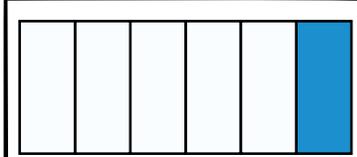
**5**



**5**

---

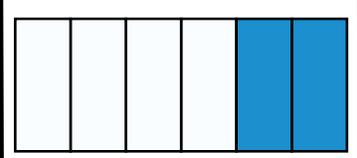
**5**



**1**

---

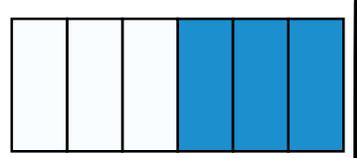
**6**



**2**

---

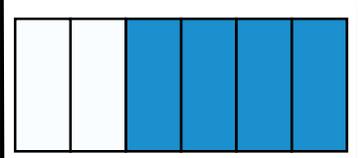
**6**



**3**

---

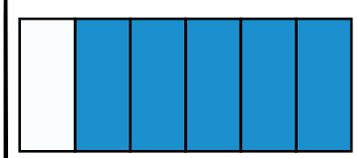
**6**



**4**

---

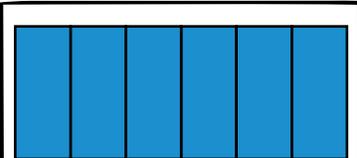
**6**



**5**

---

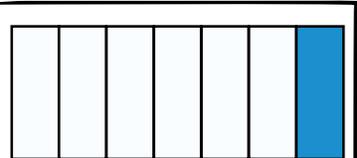
**6**



**6**

---

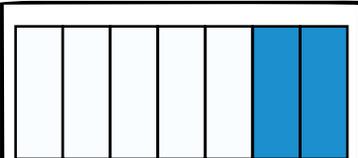
**6**



**1**

---

**7**



**2**

---

**7**

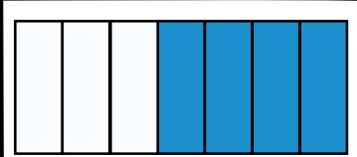


**3**

---

**7**

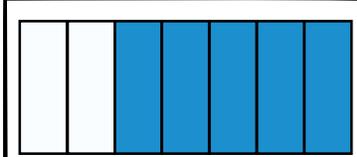




**4**



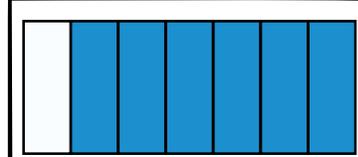
**7**



**5**



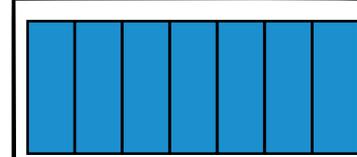
**7**



**6**



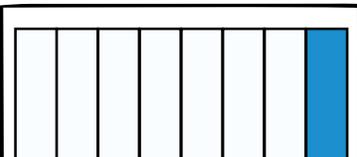
**7**



**7**



**7**



**1**



**8**



**2**



**8**



**3**



**8**



**4**



**8**



**5**



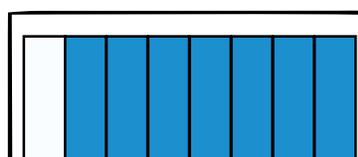
**8**



**6**



**8**



**7**



**8**

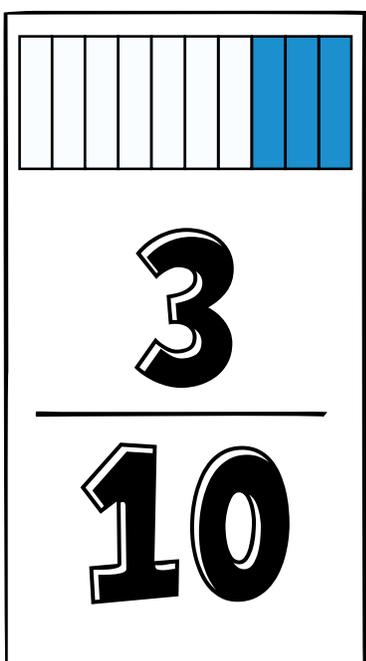
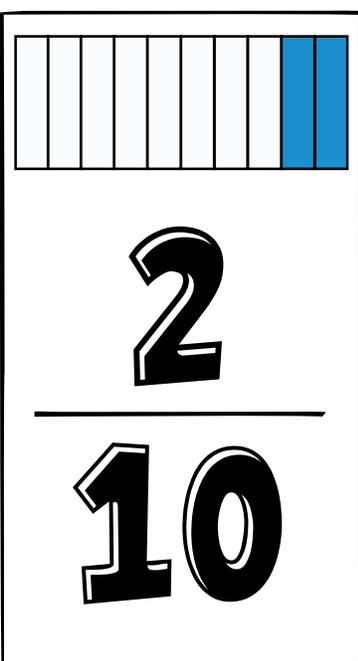
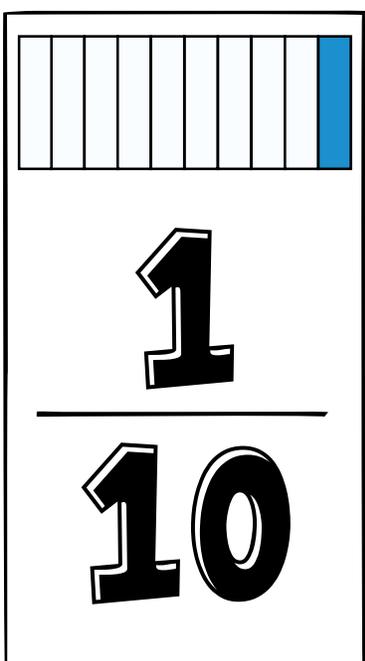
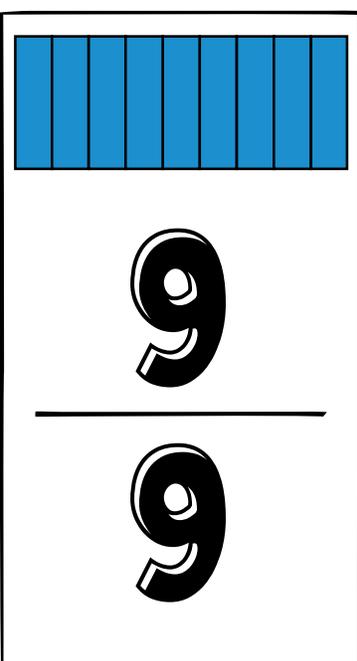
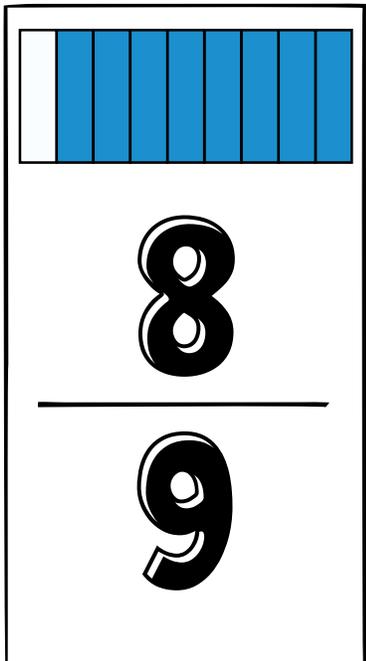
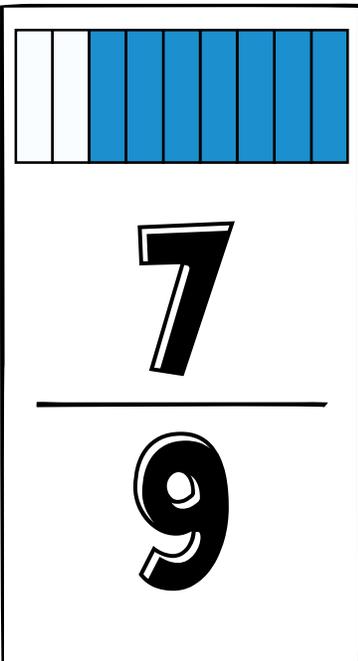
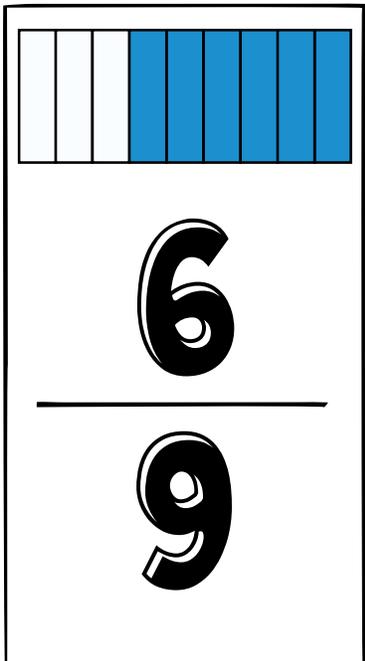
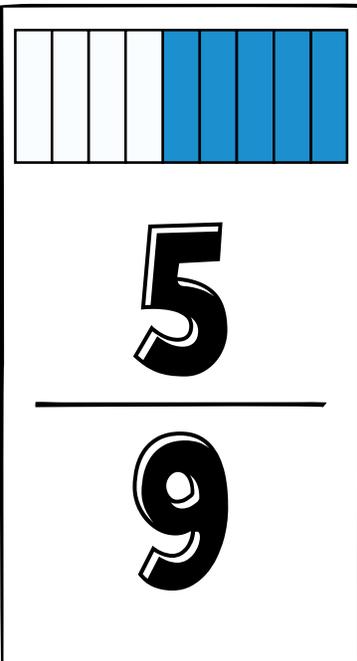
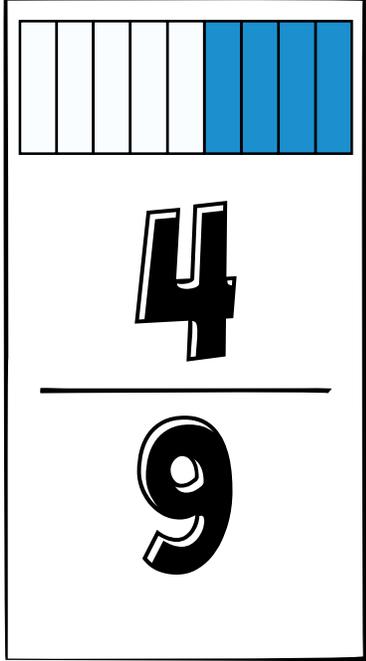
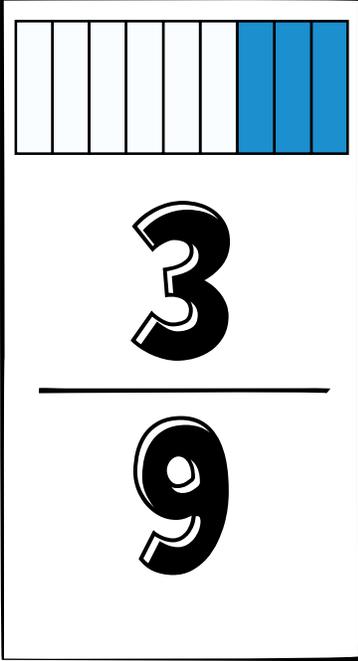
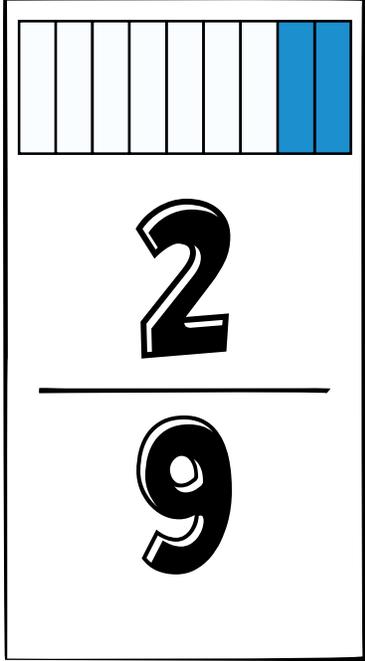
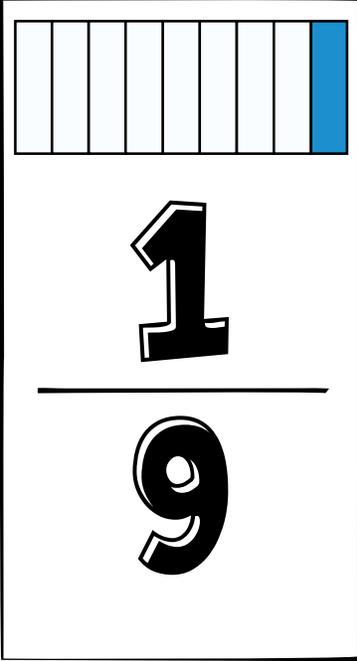


**8**

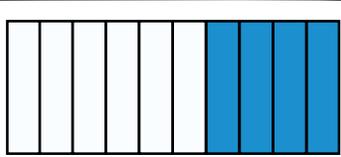


**8**





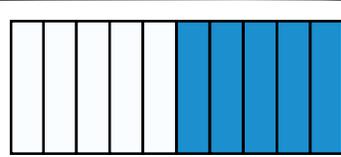




**4**

---

**10**



**5**

---

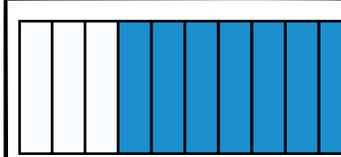
**10**



**6**

---

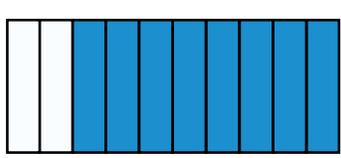
**10**



**7**

---

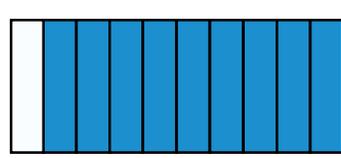
**10**



**8**

---

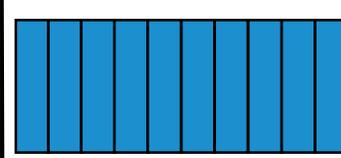
**10**



**9**

---

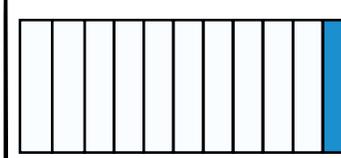
**10**



**10**

---

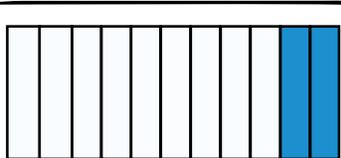
**10**



**1**

---

**11**



**2**

---

**11**



**3**

---

**11**



**4**

---

**11**



**5**

---

**11**





**6**

---

**11**



**7**

---

**11**



**8**

---

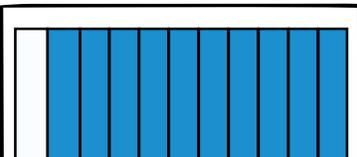
**11**



**9**

---

**11**



**10**

---

**11**



**11**

---

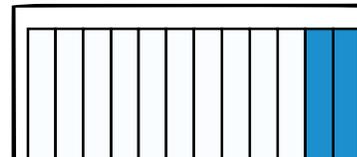
**11**



**1**

---

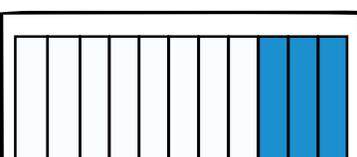
**12**



**2**

---

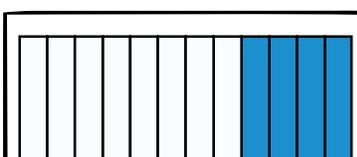
**12**



**3**

---

**12**



**4**

---

**12**



**5**

---

**12**

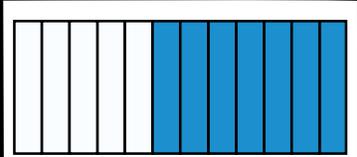


**6**

---

**12**

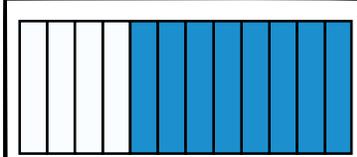




**7**

---

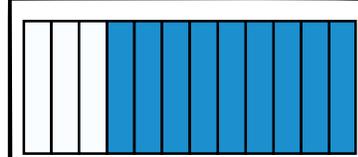
**12**



**8**

---

**12**



**9**

---

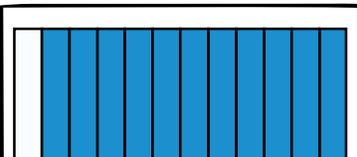
**12**



**10**

---

**12**



**11**

---

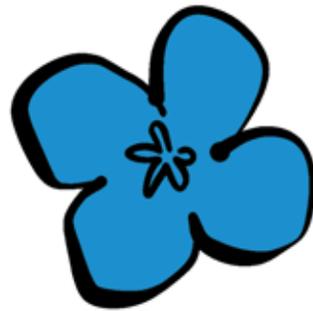
**12**



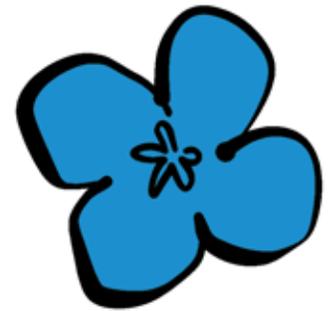
**12**

---

**12**



**WILD  
CARD**



**WILD  
CARD**

# Additional Resources Available from Alberta Canola



**Join Chase Duffy in his other adventures.  
Visit [www.learncanola.com](http://www.learncanola.com) for all  
the other resources.**



A