

K-1 At-Home Learning Resources

(Yellow Packet)

Week #10

The Richland School District cares deeply about the well-being of our students and families. We highly encourage our students and families to set a daily routine that includes the following:

For our elementary families:

- Read daily with your child
- Play family games (board games, cards, puzzles, charades, pictionary, etc.)
 - Engage in an outside activity
 - Cook/bake with your child
- Maintain relationships with your child's teacher

These supplemental activities, readings, and other resources are available to students and families to continue learning and exploring while schools are closed in response to the novel coronavirus.

Students are not required to complete and/or turn in any assignments nor will any of these materials be used to assess students academically. Please feel free to use these optional resources as needed. Additional resources are available at:

<https://www.rsd.edu/programs/at-home-learning/pre-k-elementary-resources>

Syllable Patterns

P.054

Piece It Together



Objective

The student will blend syllables in words.



Materials

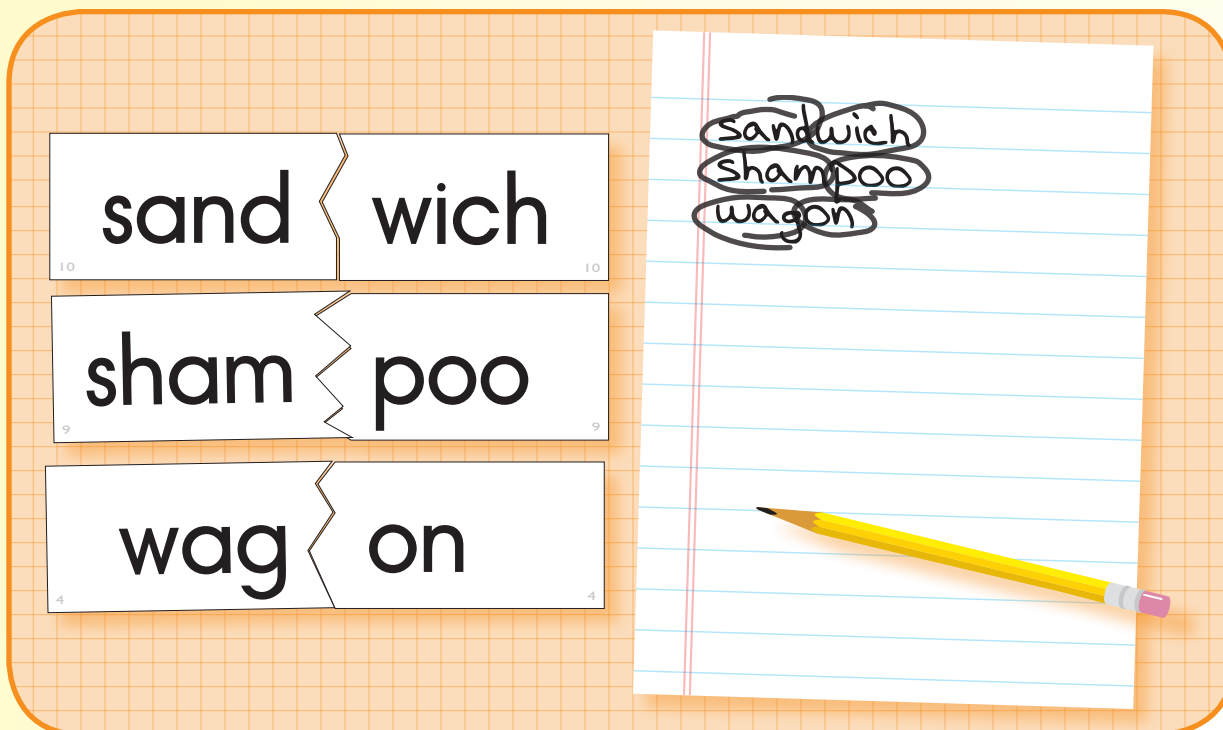
- ▶ Puzzle pieces (Activity Master P.054.AM1a - P.054.AM1d)
Copy on card stock, laminate, and cut.
- ▶ Bag
Place all puzzle pieces in the bag.
- ▶ Paper
- ▶ Pencils



Activity

Students make words from syllable puzzle pieces.

1. Place bag of puzzle pieces on a flat surface. Provide each student with paper.
2. Taking turns, students pull one puzzle piece from the bag until all pieces are distributed.
Combine pieces with the same number.
3. Say the syllable on each puzzle piece, blend, and read the word (e.g., “sand - wich, sandwich”)
4. Write the word and circle the syllables.
5. Continue until all puzzles are complete, recorded, and syllables are circled.
6. Teacher evaluation

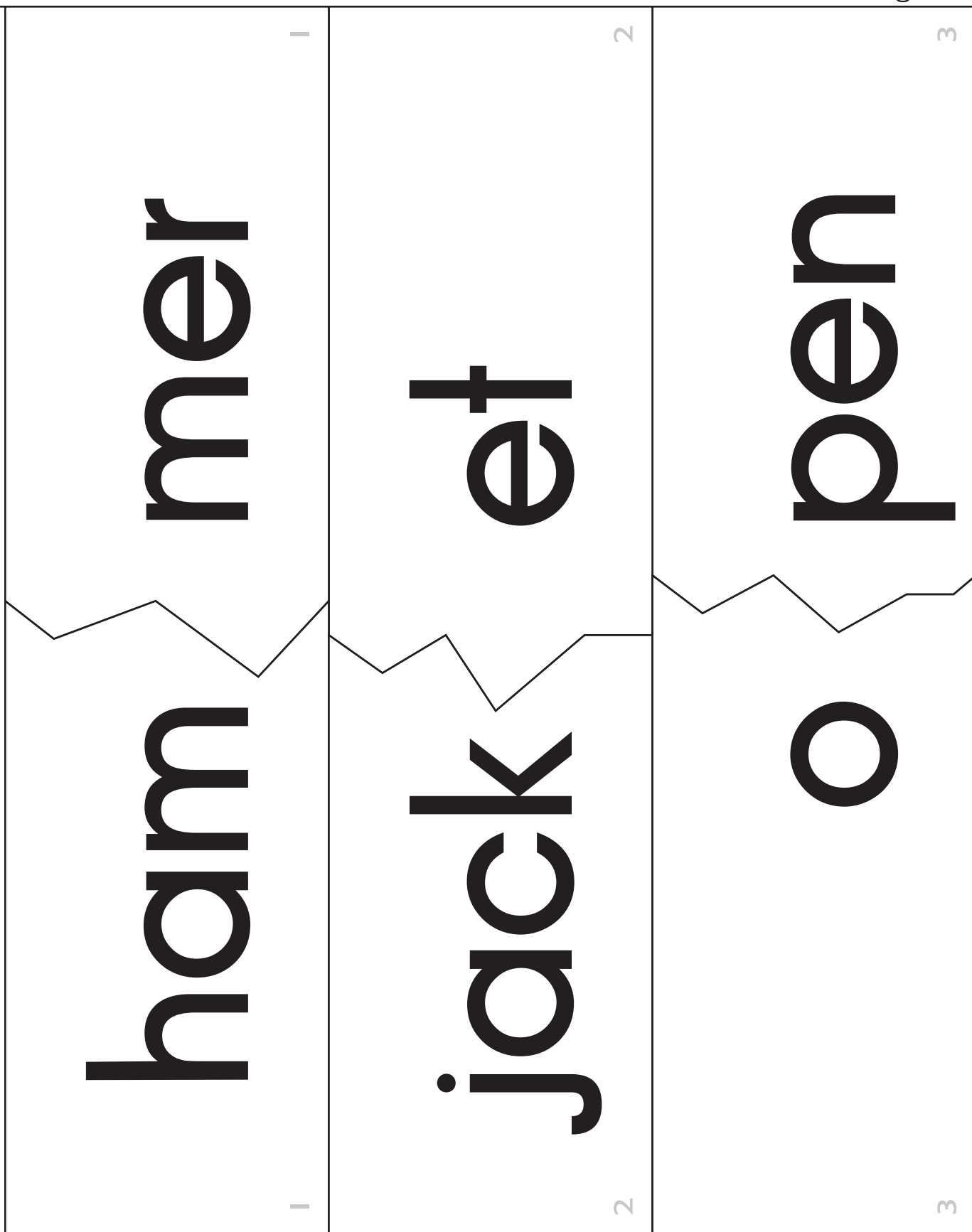


Extensions and Adaptations

- ▶ Complete three syllable puzzles (P.054.AM 2a –P.054.AM2b).
- ▶ Make other word puzzles (Activity Master P.054.AM3).

P.054.AM1a

Piece It Together



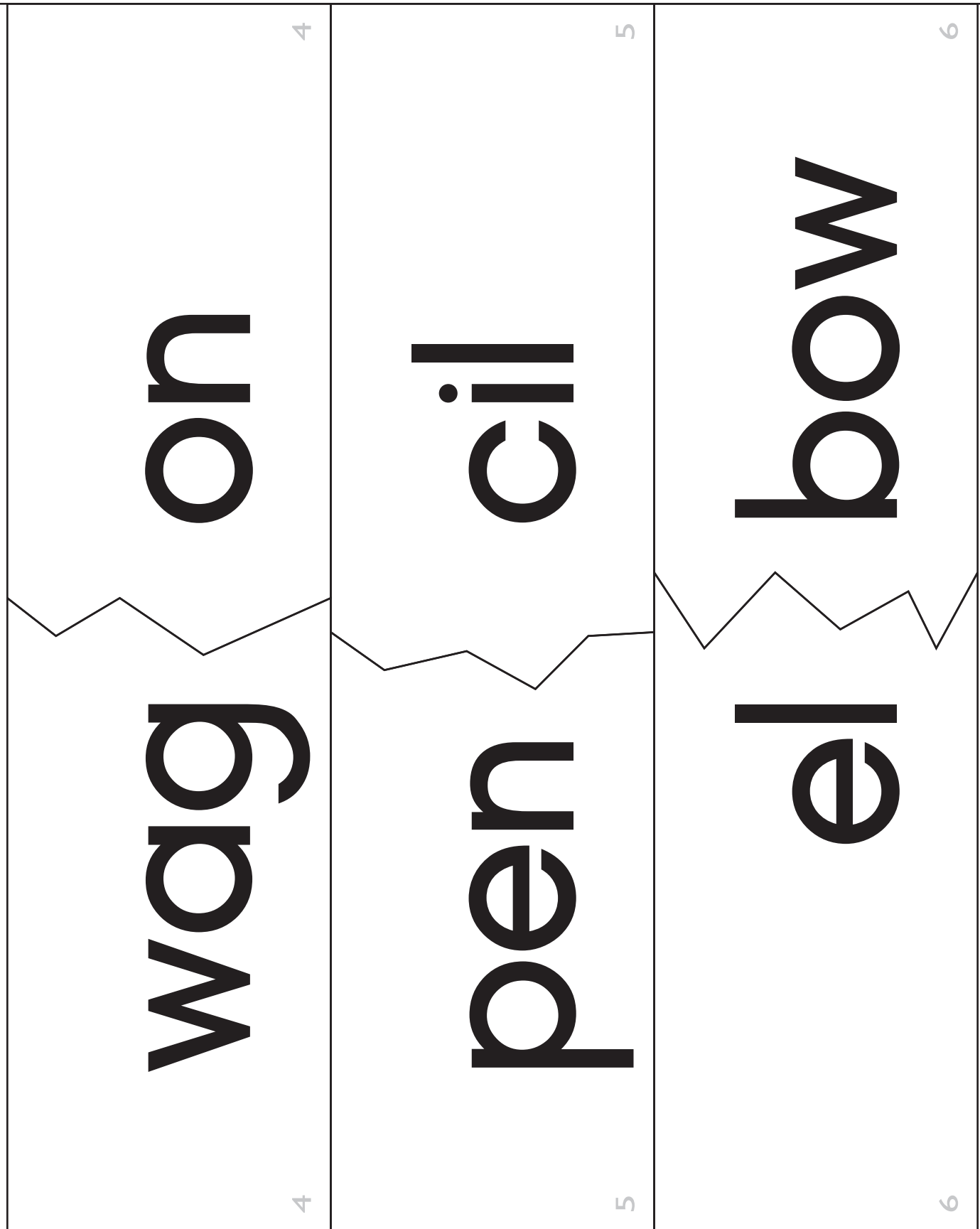
puzzle pieces



Phonics

Piece It Together

P.054.AM1b

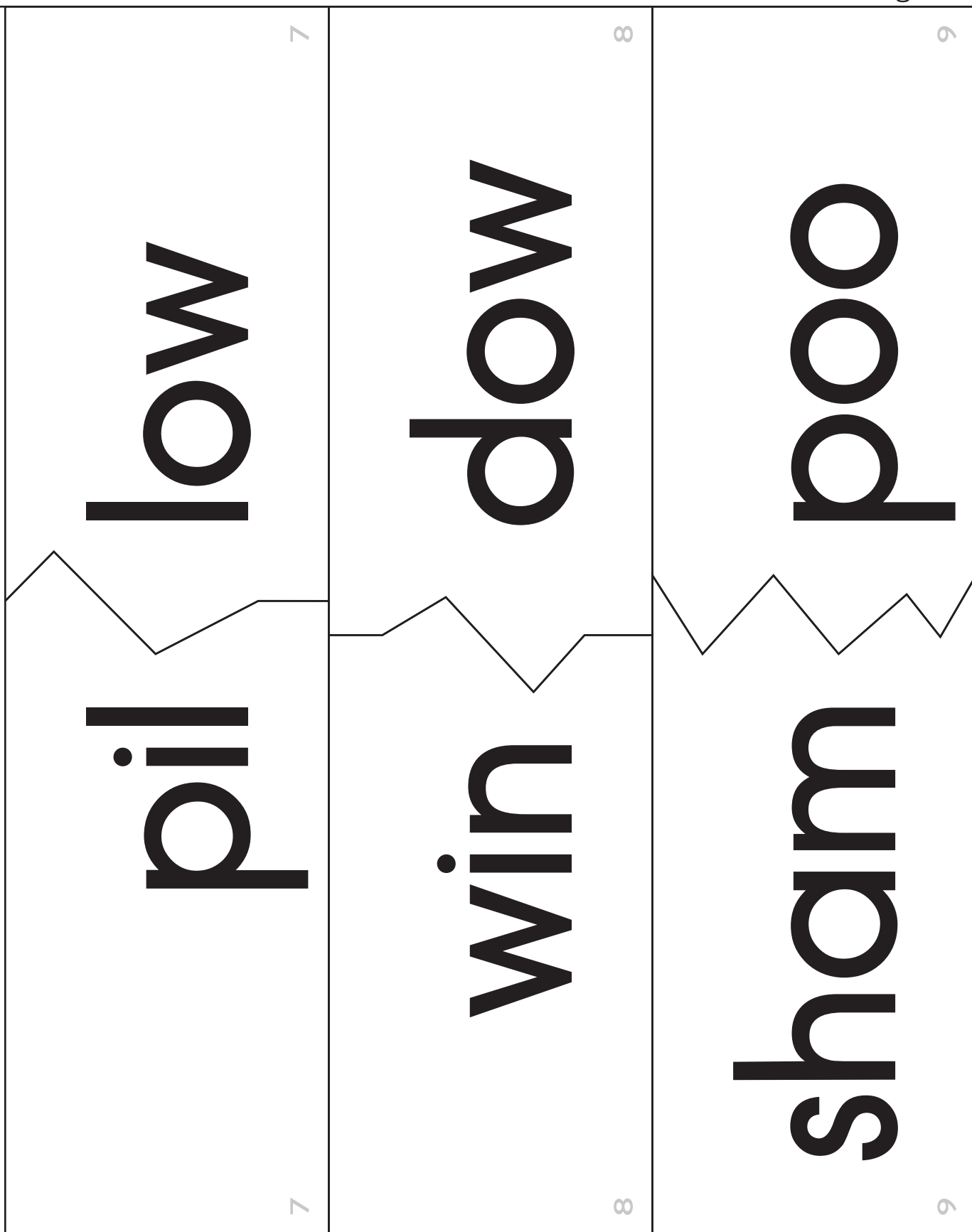


puzzle pieces



P.054.AM1c

Piece It Together



puzzle pieces



Phonics

Piece It Together

P.054.AMId

sand

wich

el

cam

ti

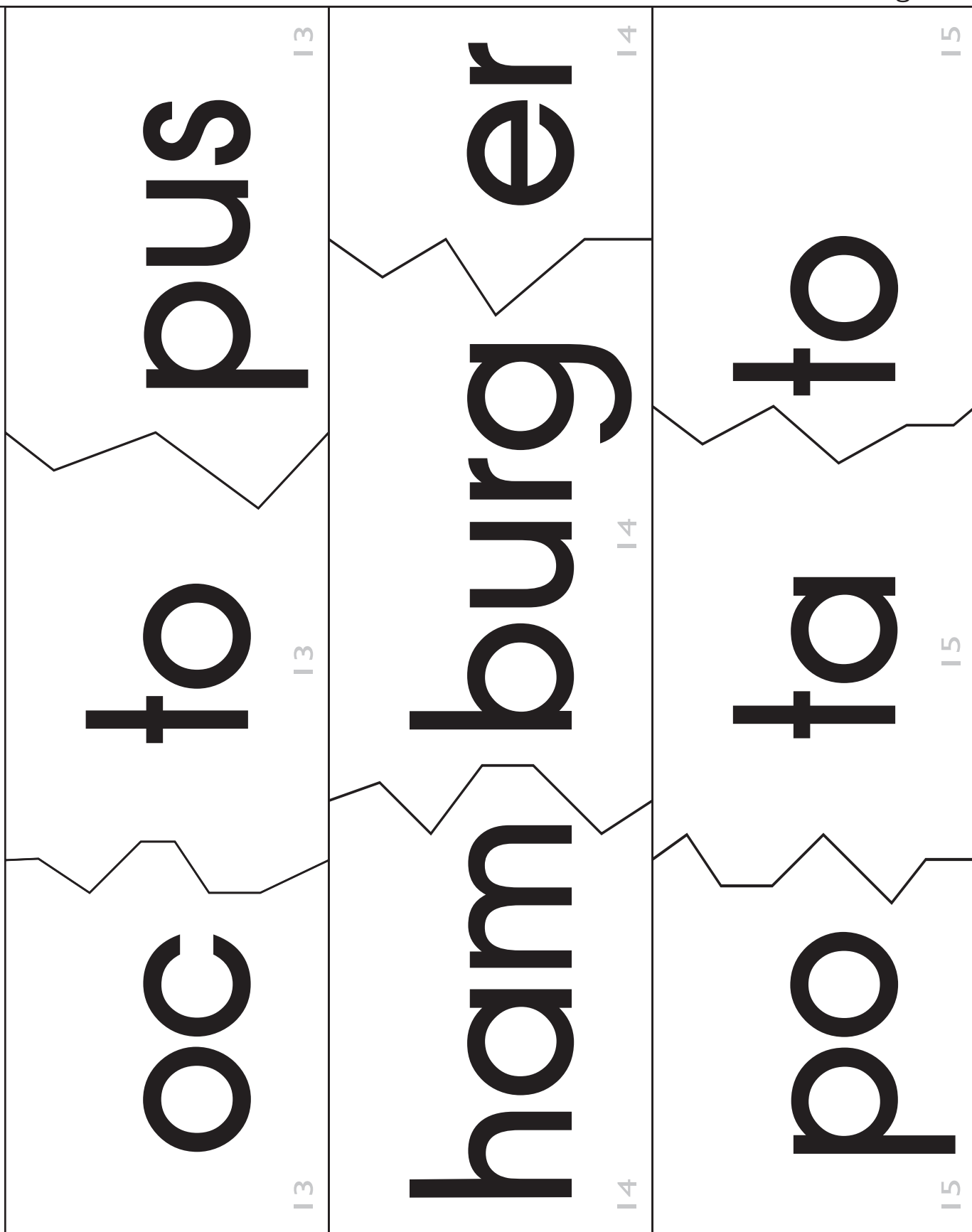
ger

puzzle pieces



P.054.AM2a

Piece It Together



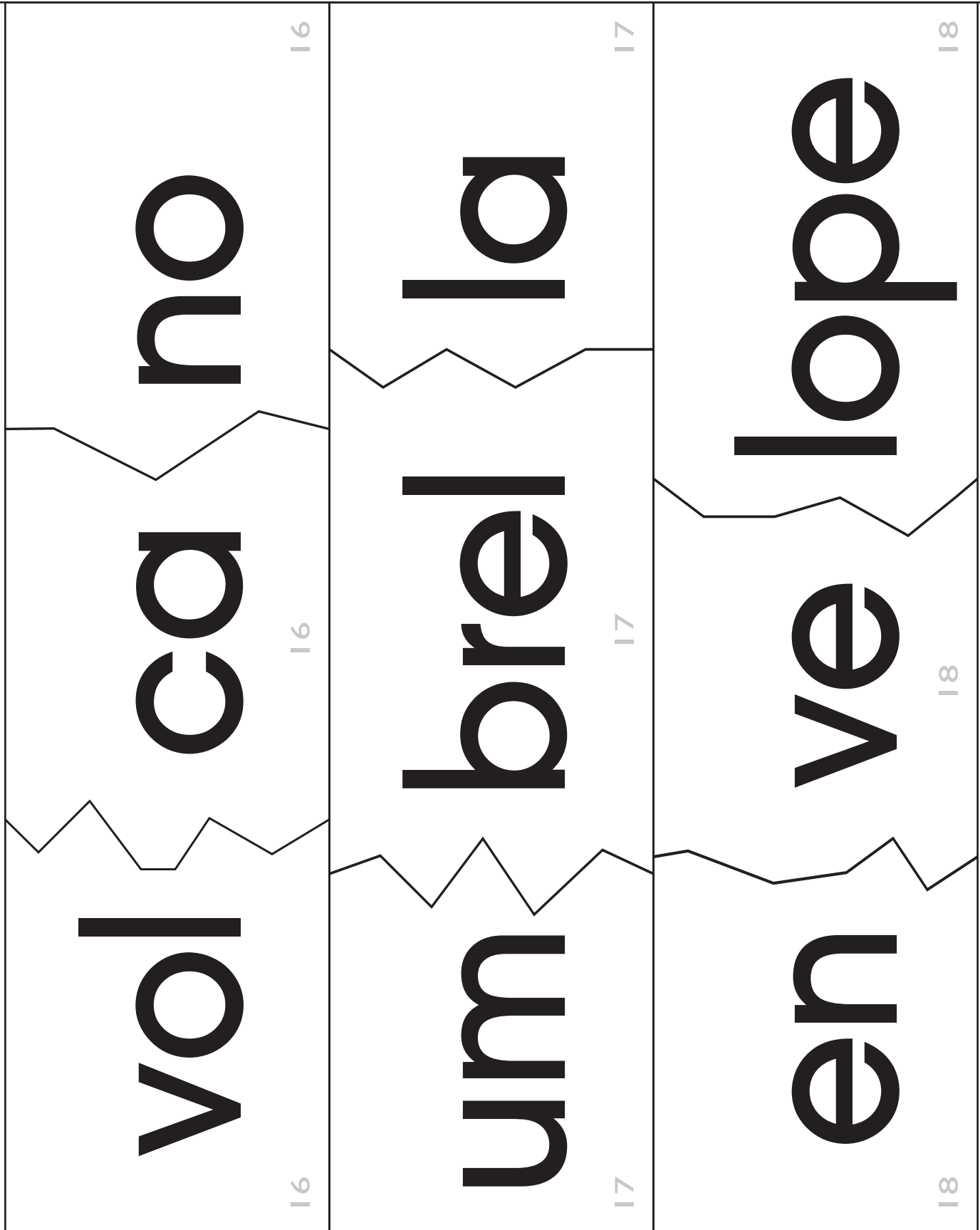
puzzle pieces



Phonics

Piece It Together

P.054.AM2b

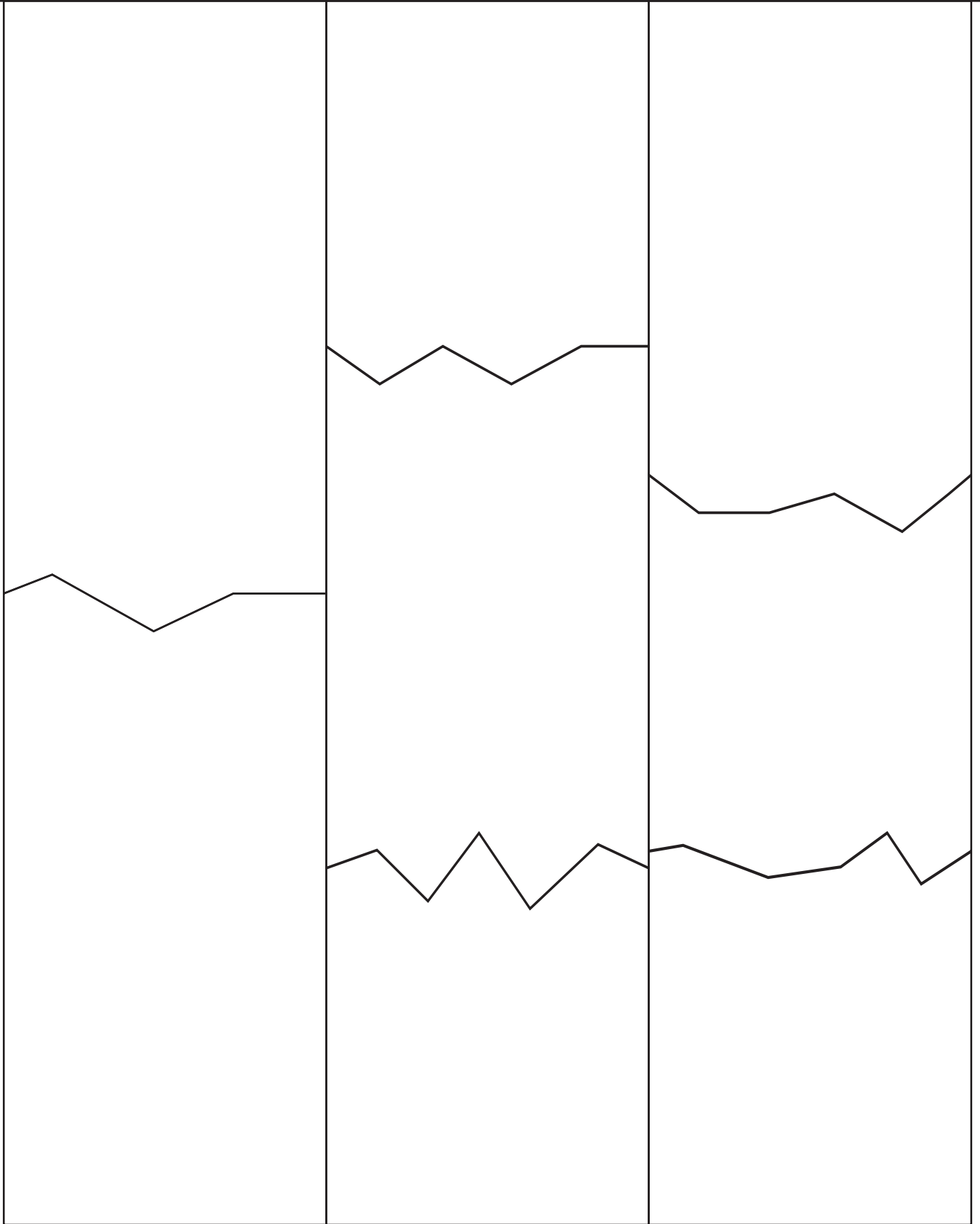


puzzle pieces



P.054.AM3

Piece It Together



blank puzzle pieces





Objective:

The student will gain speed and accuracy in reading phrases.



Materials:

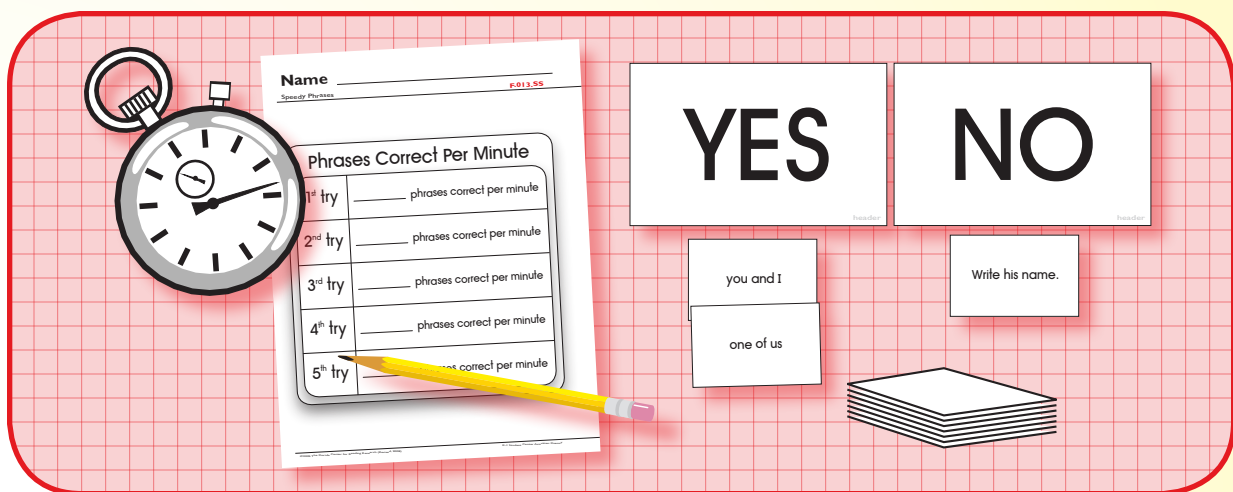
- ▶ Phrase cards (Activity Master F.013.AM1a - F.013.AM1f)
- ▶ Phrases correct per minute record student sheet (Activity Master F.013.SS)
- ▶ YES and NO header cards (Activity Master F.006.AM1)
- ▶ Timer (e.g., digital)
- ▶ Pencils



Activity

Students read phrases in a timed activity.

1. Place the set of phrase cards face down in a stack. Place the timer at the center. Place the YES and NO header cards face up next to each other. Provide each student with a phrases correct per minute record.
2. Working in pairs, student one sets the timer for one minute and tells student two to “begin.” Student two selects the top card and reads the phrase aloud while student one follows along silently.
3. If all the words in the phrase are read correctly, student one places the card in a pile under the “YES” header card. If one or more words in the phrase are read incorrectly, places it in a pile under the “NO” header card.
4. Continue activity until the timer goes off. Count the phrase cards in the “YES” pile and record the number on the phrases correct per minute record. Read phrases in the “NO” pile together.
5. Reverse roles and repeat the activity attempting to increase speed and accuracy.
6. Continue until student sheet is complete.
7. Teacher evaluation



Extensions and Adaptations

- ▶ Write and use other phrases.
- ▶ Graph individual words read correctly per minute (Activity Master F.007.SS1a-F.007.SS1d).

Fluency

Speedy Phrases

F.013.AM1a

I like them.

you and I

She called me.

We have some.

It is time.

This is my dog.

one of us

these people



in the water

by the time

How old are you?

Look at me.

You may go.

how many

a long day

my number is



Fluency

Speedy Phrases

F.013.AM1c

it has been

Write her name.

some of you

it could be

The cat is little.

Look for them.

There you are.

She will go.



one at a time

What are these?

Look at this.

I made some

about the time

You can go.

one or the other

Write his name.



Fluency

Speedy Phrases

F.013.AM1e

some of them

look at each

Call her now.

She said that.

they have been

What time is it?

Write the word.

some may get



he would like

Who said that?

Who are you?

Now we will go.

What could it be?

We will use this.

Write the number.

They are with him.



Name _____

Speedy Phrases

F.013.SS

Phrases Correct Per Minute

1st try

_____ phrases correct per minute

2nd try

_____ phrases correct per minute

3rd try

_____ phrases correct per minute

4th try

_____ phrases correct per minute

5th try

_____ phrases correct per minute



Compound Word Hunt



Objective

The student will identify the meaning of compound words.



Materials

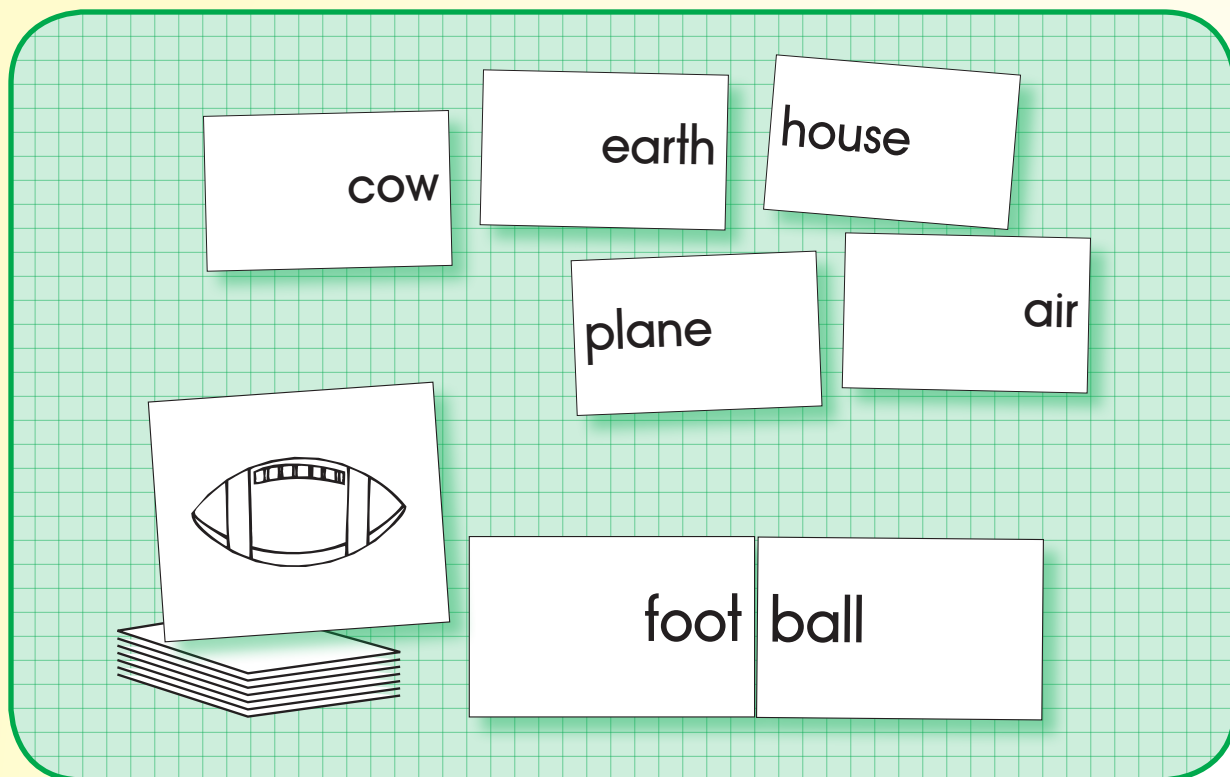
- ▶ Compound word cards (Activity Master V.009.AM1a - V.009.AM1c)
- ▶ Picture cards (Activity Master V.009.AM2a - V.009.AM2b)



Activity

Students make compound words by pairing word cards that name pictures.

1. Scatter compound word cards face up on a flat surface. Place picture cards face down in a stack.
2. Working in pairs, student one selects a picture card from the stack, names the picture (e.g., “football”), and says to partner, “What two words make this word?”
3. Student two repeats the word, identifies the two separate words (i.e., “football is made up of foot and ball”), and “hunts” for the two words. Places the cards together to make the compound word, and reads the word (i.e., “football”).
4. Reverse roles and continue until all pictures are matched with the words that form compound words.
5. Peer evaluation



Extensions and Adaptations

- ▶ Make and match other compound words (Activity Master V.006.AM3) and matching pictures (Activity Master V.009.AM3).

air plane

bird house

cow boy

earth worm



Vocabulary

Compound Word Hunt

V.009.AM1b

finger nail

foot ball

jelly fish

rain bow

compound word cards



rattle snake

sun light

tooth brush

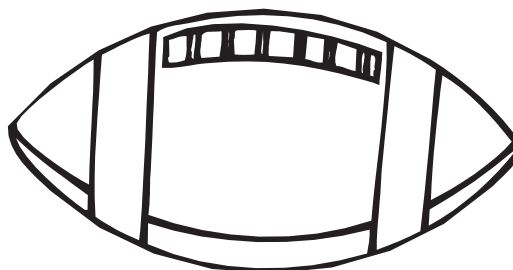
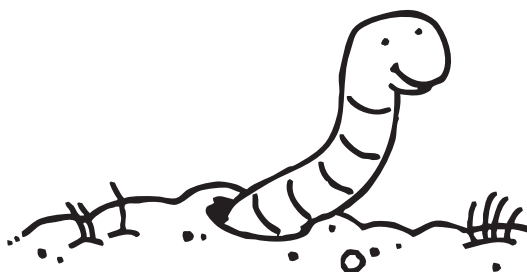
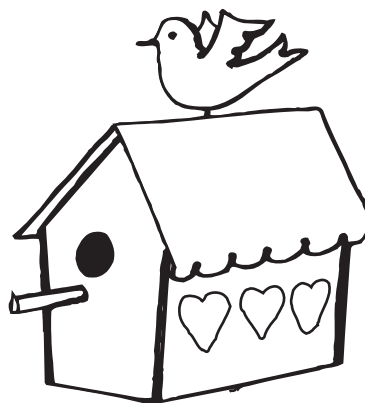
water melon



Vocabulary

Compound Word Hunt

V.009.AM2a



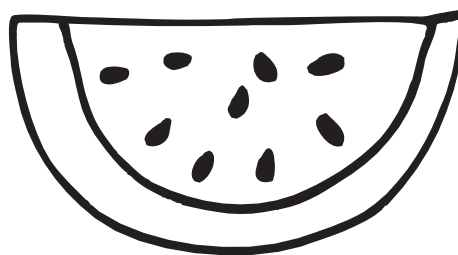
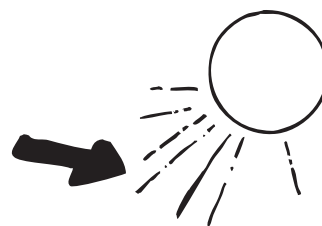
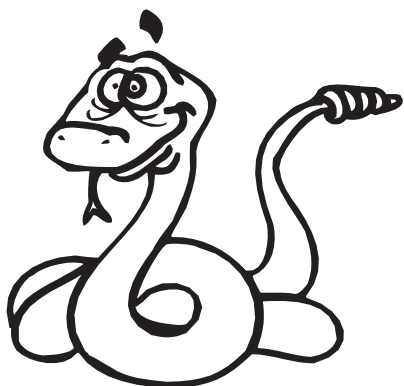
picture cards: airplane, birdhouse, cowboy, earthworm, fingernail, football



Vocabulary

V.009.AM2b

Compound Word Hunt



picture cards: jellyfish, rainbow, rattlesnake, sunlight, toothbrush, watermelon



Vocabulary

Compound Word Hunt

V.009.AM3

blank cards



Questions to Ask Before, During, and After Reading

These are questions to help engage students in discussions and conversations about reading. These questions are just suggestions and other questions can be added to this list based upon the type of reading students are involved in.

Before Reading

- What is the title of the book or text?
- What does this title make you think about?
- What do you think you are going to read about? (Make a Prediction)
- Does this remind you of anything?
- Are you wondering about the text or do you have any questions before reading?
- Skim through the article. Do any pictures, key words, and/or text features stand out to you?

During Reading

- What is happening so far?
- What does the word _____ mean on this page?
- What do you think the author is trying to communicate in this part?
- What do you think was important in this section? Why do you think it was important?
- What can you infer from this part of the text?
- Where is the story taking place?
- Who are the characters so far?
- What do you think will happen next?
- What does this part make you think about?
- What questions do you have?
- What words help you visualize what the author is saying?
- Is there a word that you struggled with? What is the word? Let's break the word into parts and look at context clues.

After Reading

- What was this text about?
- What was the main idea? What details from the text helped you determine the main idea?
- What did you learn from this text?
- How did the author communicate his/her ideas?
- What does this text remind you of?
- What was your favorite part and why?
- Did this text have a problem? If so, what was the problem and what was the solution?
- What is your opinion about this text? What are some parts that helped you make that opinion?
- What are some questions you still have about the text?
- Does this text remind you of other texts you have read? How are they alike and/or different?
- What is a cause and effect from the text you read?

Football



By Clark Ness

Visit www.clarkness.com and www.readinghawk.com
for free ebooks and stories.

Reading Level: Flesch-Kincaid Grade Level 3.6

Nonfiction



A football is a
funny-shaped ball.



Players use a
football to play an
exciting game
called football.



In football, a
player can run with
a football.



In football, a
player can pass a
football.



In football, a
player can catch a
football.



In football, a
player can kick a
football.



In football, points are scored when the football crosses the goal line.



Football is a fun
game to play, and it
is played with a
football.

More free ebooks and stories are available at www.clarkness.com and www.readinghawk.com.
Text Copyright © 2013 by Clark Ness. Images are from Microsoft Office Images unless otherwise noted. Permission is granted for printing, photocopying, emailing, recording, storing in a retrieval system, and transmitting this story in any form, or by any means, mechanical and/or electronic. Sale of this story and/or uploading to a commercial bookstore or commercial website is strictly forbidden without prior written permission.

Jacob is a Car

By Clark Ness

www.clarkness.com



One day when Jacob got up, he went to his mother. "Mom, I want to be a car," he said.

"Well, that would be cool. If you want to be a car, you can be a car," said Jacob's mother. "Try to be a neat car."

Jacob went out to the street with his magic nickel.

"Car, car, car," he said. *Poof!* He was a car. He was red.

"I bet I can go fast," he said, and with that, he started up. Up the street went Jacob. He was fast.

"I am a fast, red car," said Jacob. "This is fun." On his way back, he said, "I wish I could be a fast, red car that could fly."

Poof! Jacob had two wings. He went up and started to fly. Up, up, up he went.

Jacob's mother looked up. "Look at that. There is a red, flying car up in the sky."

Jacob went near his mother.

"Mom, look at me," he said. "I am a red car that can fly."

"Jacob, you look neat," said his mother. She went and got her magic nickel.

"Flying car, flying car, flying car," said Jacob's mother.

Poof! Jacob's mother was a flying car. She was black and looked cool. Up, up, up she went into the sky. Soon she was flying near Jacob.

"This is fun," said Jacob's mother.

"It is neat you are flying with me, Mom," said Jacob.

The two flying cars could see a lot from up in the sky. They went near Jacob's school. They went near tall trees. They had a lot of fun.

"We need to go back," said Jacob's mother. Soon they landed.

"Jacob, Jacob, Jacob," said Jacob with his nickel, and *poof*, Jacob was Jacob.

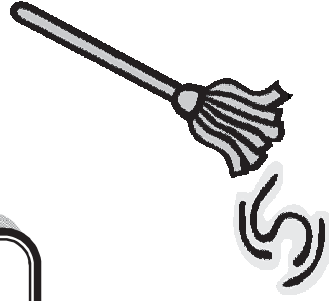
"Jacob's mom, Jacob's mom, Jacob's mom," said Jacob's mother with her nickel, and *poof*, Jacob's mother was Jacob's mother.

"We need to have Dad be a flying car," said Jacob.

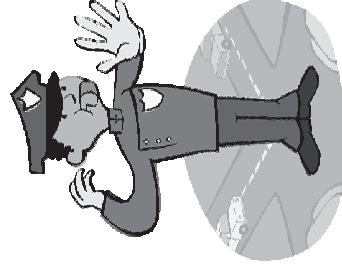
"Yes, it would be neat for him to be a flying car," said Jacob's mother.

Drop the Mop!

Focus: Words in the -op family

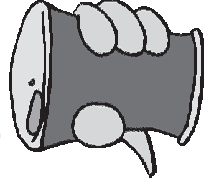


This is your mop.
Hop on top of the mop.
You can hop on your mop.
Your mom said "Stop!,
Do not hop on the mop!"
She said, "Drop the mop!"



The cop had a can of pop.
He opened the top.
The boy wanted the pop.
The cop said, "Stop!"

Did the cop give his pop to the boy?
He did not.



He said, "Drop the pop!"

Name: _____

1) What did your mom say?

I

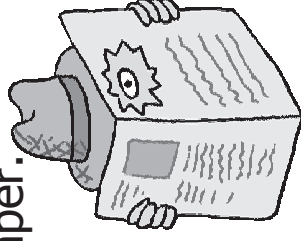
2) What did the cop have?

3) Who wanted the cop's pop?

The Spy Will Try Not to Cry

Focus: Long "i" with _y Words

The spy does not know why
 someone put a hole in his paper.
 The spy will try not to cry.
 For now, his eyes are dry,
 but later he may cry.



The spy goes on a plane in the sky.
 He acts shy so he can spy on two
 sly men who fly on the plane.
 He sees them try to stop the plane.
 He stops the men and makes them cry.

They wonder why the spy saw them fly.
 They were sly, but now they cry.
 The spy has dry eyes.
 He does not cry.
 He is a sly spy.

Name: _____

1) What will the spy try not to do?

2) Where are the two sly men?

3) Does the spy cry?

The plant life cycle

By ThoughtCo.com, adapted by Newsela staff on 02.11.20

Word Count **384**

Level **430L**



Sunflower, *Helianthus annuus*, with a seedling in a ceramic pot. A seedling is a small, young plant. It grows out of the ground and toward the sunlight. Photo: Martin Shields/Science Source

Have you ever planted seeds? Did they grow and flower? You've watched a plant's life cycle. It is the steps a plant goes through as it grows.

Seeds

The life cycle of flowering plants begins with a seed. The shell protects the embryo. It grows into a new plant. The endosperm is in the shell, too. It has nutrients that the seed uses to start growing.

Seeds can grow in different places. How do they get there? The wind blows some. Others float on water. Sometimes animals carry seeds away. The next phase starts when a seed gets someplace it can start growing.

Germination

Seeds grow when it has the right things. It needs oxygen from the air. It needs water and sunlight. It cannot be too hot or too cold. This stage is called germination. Roots push their way through the seed coating and grow into the ground. Seedlings start to grow.

Seedlings

A seedling is a small, young plant. It grows out of the ground and toward the sunlight. The chlorophyll that makes leaves green traps the sun's energy. Then, the plant makes food from water and carbon dioxide. This process is called photosynthesis. It gives plants the energy to grow.

Adult Plant

Seedlings grow into adult plants with roots and stems. Roots take in nutrients and water. The stem hold up the plant. It carries nutrients, too. Nutrients move from the roots to the rest of the plant.

The flower is where seeds are made. The stamen and the pistil are two important parts.

The stamen are long stalks. It holds pollen. It is a yellow powder. Pollen is important because it has half of the genes needed to create a new plant. The genes are why plants have different characteristics.

The stigma is at the top of the pistil. It collects pollen. The ovules are in the bottom of the pistil. Ovules can turn into seeds.

Pollination

Pollination is when pollen goes into the stigma. How does pollen get there? Insects pick up pollen from flowers. They bring the pollen to new plants.

Pollen has half of the genes a new plant needs. The ovule has the other half. Fertilization is when pollen and the ovule combine. This makes seeds that grow into new plants.

Quiz

1 What is the section "Adult Plant" MAINLY about?

- (A) the size of an adult plant
- (B) the parts of an adult plant
- (C) the ways seeds grow into adult plants
- (D) the ways pollen helps adult plants

2 Read the following paragraph from the section "Seeds."

Seeds can grow in different places. How do they get there? The wind blows some. Others float on water. Sometimes animals carry seeds away. The next phase starts when a seed gets someplace it can start growing.

What is the focus of this paragraph?

- (A) where seeds grow
- (B) when seeds grow best
- (C) what seeds need to grow
- (D) which seeds grow best

3 What event in the plant life cycle happens after a seedling grows into an adult plant?

- (A) stamen
- (B) germination
- (C) pollination
- (D) roots

4 Why seeds grow into seedlings?

- (A) because they grow roots and stems
- (B) because they use chlorophyll to turn their leaves green
- (C) because they get too hot or too cold
- (D) because they have oxygen, water and sunlight

Plant anatomy

By Gale, Cengage Learning, adapted by Newsela staff on 01.23.20

Word Count **463**

Level **440L**



Image 1. A visitor inspects a log from a fallen Redwood tree in California. Photo: Inga Spence/Science Source

Plants come in all shapes and sizes. Some are huge, like trees. Some are as small as a grain of sand. Plants might look different, but they share a similar structure.

Most plants are called vascular plants. This means they have a vascular system. It is like a transportation system. The vascular system moves nutrients and water around the plant.

At The Root Of It

Vascular plants have roots. They help the plant in many ways. For most plants, the roots are underground. They act as an anchor. They keep the plant in place.

Plants have tiny hairs on their roots. They help the plant absorb water. There are nutrients in the water. The roots absorb the nutrients, too. This happens through a process called osmosis. During osmosis, water moves into the plant. It does not require the plant to use energy.

Like all living things, plants are made up of cells. Cells are the building blocks of life. Each cell is surrounded by a cell membrane. It controls what goes in and out of the cell. During osmosis, water moves into the root cells. It passes through the membrane. Then, it enters the cell.

Holding It All Together

Next, the water moves up the roots to the stem. All vascular plants have stems. The stem holds up the plant. It can store water and food.

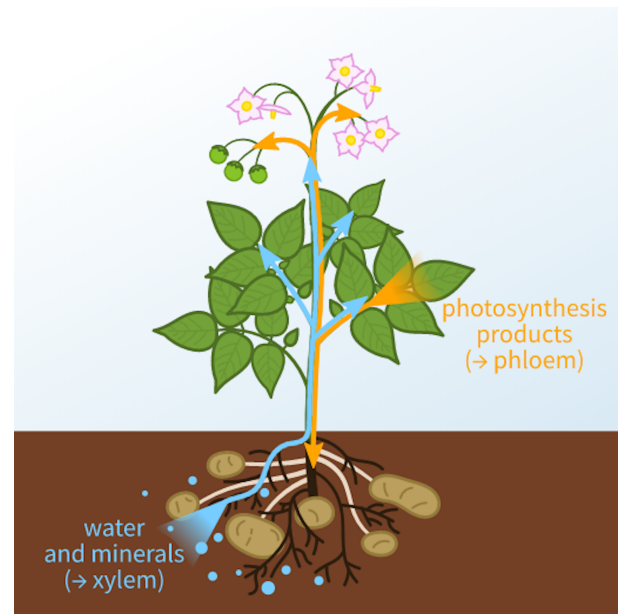
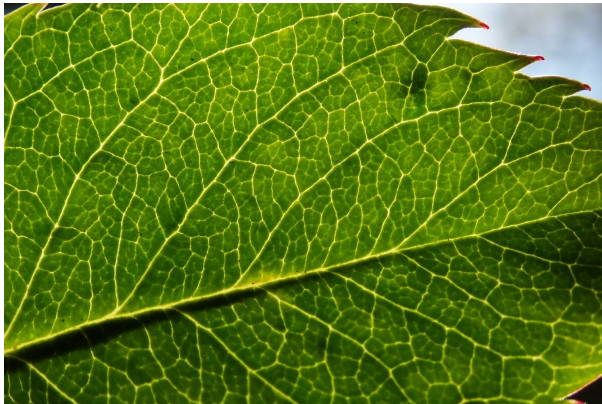
Some plants have flexible stems. Others have stiff stems. For example, grasses have stems that bend in the wind. Trees have stems that are hard and woody.

The stem contains tubes. They are the xylem and the phloem. Xylem carries water around the plant. Phloem carries food around the plant. Phloem and xylem are found in the roots, stems and leaves. They are like highways. They move water and nutrients around the plant.

Making Food And Oxygen

Next, water and nutrients move into the leaf. They enter the leaf through the xylem. Then, the water and nutrients move into the veins of the leaf. The veins branch into smaller passageways. This allows the water to reach all parts of the leaf.

Plants make their own food in the leaves. This process is called



photosynthesis. It requires water, sunlight and carbon dioxide, a gas in the air. Photosynthesis makes sugars. The plant uses the sugars for food. Photosynthesis also makes oxygen.

Quiz

- 1 How are xylem different from phloem?
- (A) A xylem is a tube, but a phloem is not.
 - (B) They carry different things in a plant.
 - (C) They are found in different parts of a plant.
 - (D) A xylem is part of a leaf, but a phloem is not.

- 2 What happens because of photosynthesis?
- (A) Plants make carbon dioxide.
 - (B) Water escapes plants.
 - (C) Plants make oxygen.
 - (D) Sugar escapes plants.

- 3 Read the paragraph from the section "At The Root Of It."

Plants have tiny hairs on their roots. They help the plant absorb water. There are nutrients in the water. The roots absorb the nutrients, too. This happens through a process called osmosis. During osmosis, water moves into the plant. It does not require the plant to use energy.

What information can the reader get from this paragraph?

- (A) what osmosis does
 - (B) where roots are located
 - (C) how membranes work
 - (D) what vascular plants are
- 4 Which answer choice is a section title?
- (A) Plant anatomy
 - (B) Some are huge, like trees.
 - (C) Then, it enters the cell.
 - (D) Making Food And Oxygen

English Language Learner Supplement K-1

Rain

By Robert Louis Stevenson

The rain is raining all around,
It falls on field and tree,
It rains on the umbrellas here,
And on the ships at sea.

Reading: Read the poem with help.

Listening: Listen as someone reads the poem to you. Make pictures in your mind of what is happening in the poem.

Speaking: Tell someone in English why you do or do not like the rain.

Writing: Write the rhyming words from the poem.

_____ and _____

Poem in the Public Domain

Writing: Draw a picture of what is happening in the poem. Label your drawing.

Suplemento para

Estudiantes que Aprenden Inglés K-1

Se recomienda que los niños completen la página en inglés para practicar las habilidades en inglés.

Lectura: Lee el poema con ayuda.

Lluvia

Por Robert Louis Stevenson

La lluvia está lloviendo por

todas partes,

Cae en campo y árbol,

Aquí llueve sobre los para-

guas,

Y en los barcos en el mar.

Poema en el Dominio Público

Escucha: Escucha mientras alguien te lee el poema. Haz fotos en tu mente de lo que está sucediendo en el poema.

Hablando: Dile a alguien en inglés por qué te gusta o no la lluvia.

Escritura: Escribe las palabras que riman de la versión inglesa del poema.

_____ y _____

Escritura: Haz un dibujo de lo que está sucediendo en el poema. Etiqueta tu dibujo.

Writing Ideas K-1 Elementary Week #10

Students can draw pictures and/or compose sentences and/or paragraphs to respond to the prompts and ideas below. This will vary depending on their grade level.

Narrative

- What does it mean to be kind? Think of a time when you or someone you know did something kind. Write a personal narrative to tell about that time. You should include when and where it happened and who and/or what was involved. Be sure to include details and have a beginning, middle, and end.

Opinion/Argument

- What is or would be your favorite pet? Write an opinion piece on your favorite pet and why that pet is the best pet to have. Add reasons, examples, and/or details to support your opinion.

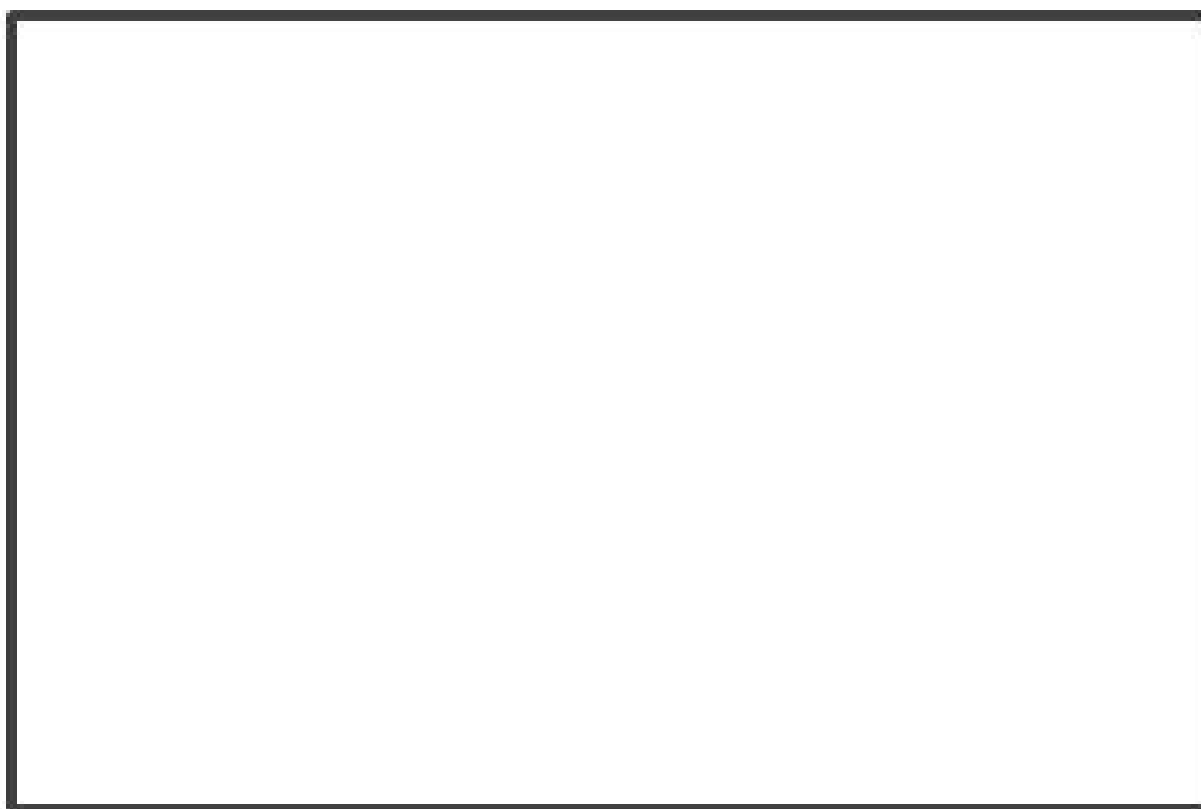
Informational/Explanatory

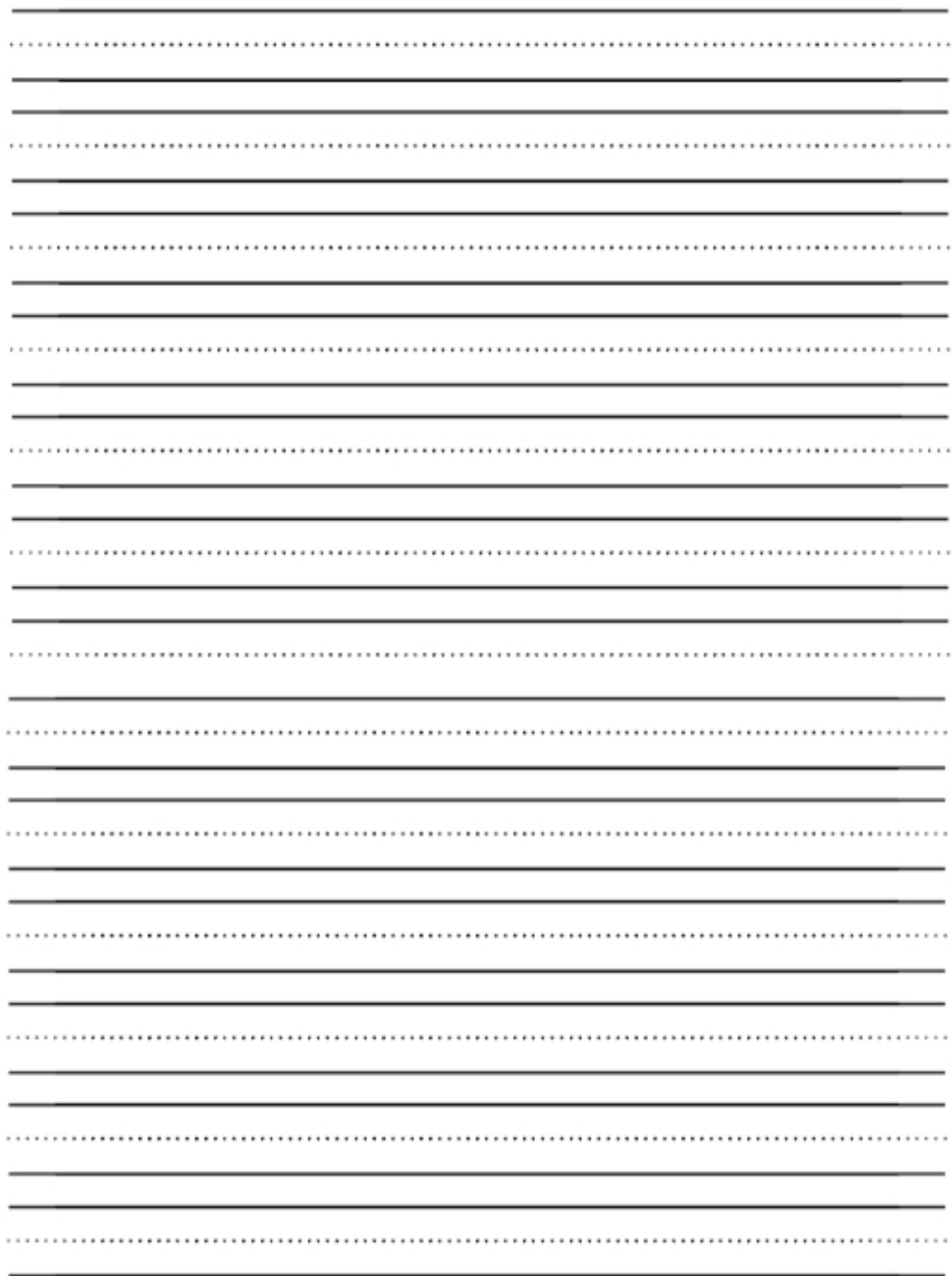
- Did you know there are many different bodies of water! Oceans, lakes, and ponds are just a few! Talk to someone in your family or do some research to find out more about bodies of water. Pick your favorite body of water and write an informational piece about it. Learn as much as you can about that body of water. Introduce your body of water and add facts, information, and/or details.

Writing in Response to Reading Bingo

Complete the Bingo board by engaging in various writing ideas from this week's reading selections. Try to get 3-in-a row!

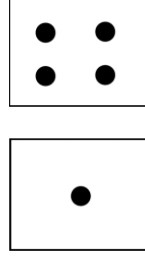
<p>!</p> <p>Rhyming words is fun! Write your own rhyming sentences, paragraphs, poem, song, or story that has words that end with -op, and/or long "i" with -y!</p>	<p>Have you ever helped to mop before? Do you help with other chores around your house? Draw a picture of you helping with the chores! Write a story to go with it!</p>	<p>What else can you find out about footballs? Draw a picture and label the parts of a football. Do some research on footballs and write an informational piece about your findings. To learn how a football is made visit https://bit.ly/2LXprAT</p>
<p>Write about how the two reading selections The plant life cycle and Plant anatomy are similar and/or different. For more fun, watch the video about a plant life cycle at https://bit.ly/2Zy2Pil</p>	<p>WRITER'S CHOICE</p>	<p>What was something important that you learned from this week's readings? Write about what you thought was important and why. Use details from the reading to help explain why you think it is important.</p>
<p>Vocabulary words are fun! Write a poem or song with some of the words from this week's readings! You can also create a bingo board with the words or draw pictures to go with each word and make your own word/picture memory game.</p>	<p>What would it be like if you were a car? Write your own silly story about your adventures as a car! Add characters, a setting, and a beginning, middle, and end.</p>	<p>What do you know about plants? Do you have plants that you can look at where you live? Look closely at the plants and write about what you see. Draw a picture and label the parts. Do some research on plants and include that in your writing.</p>





Dot Card Addition

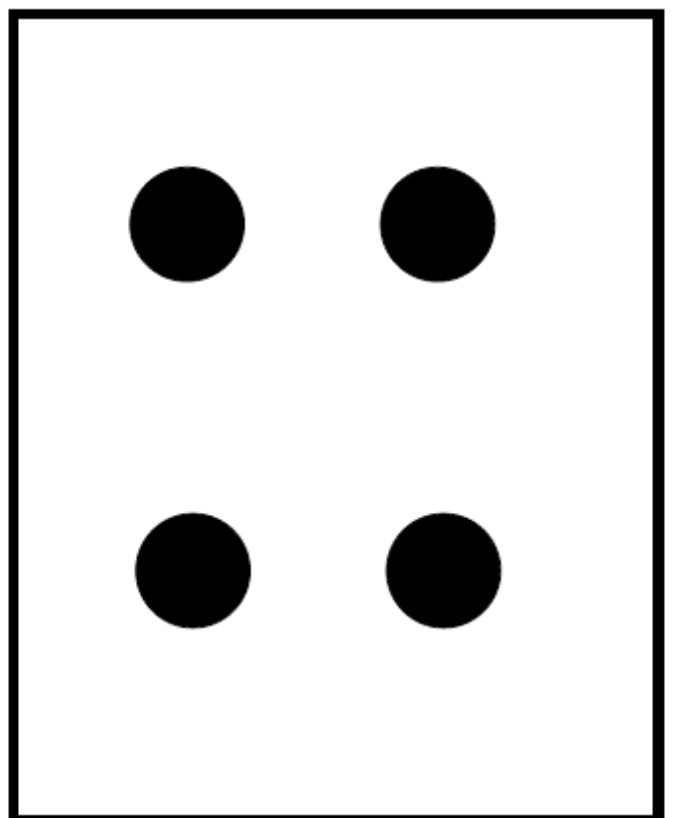
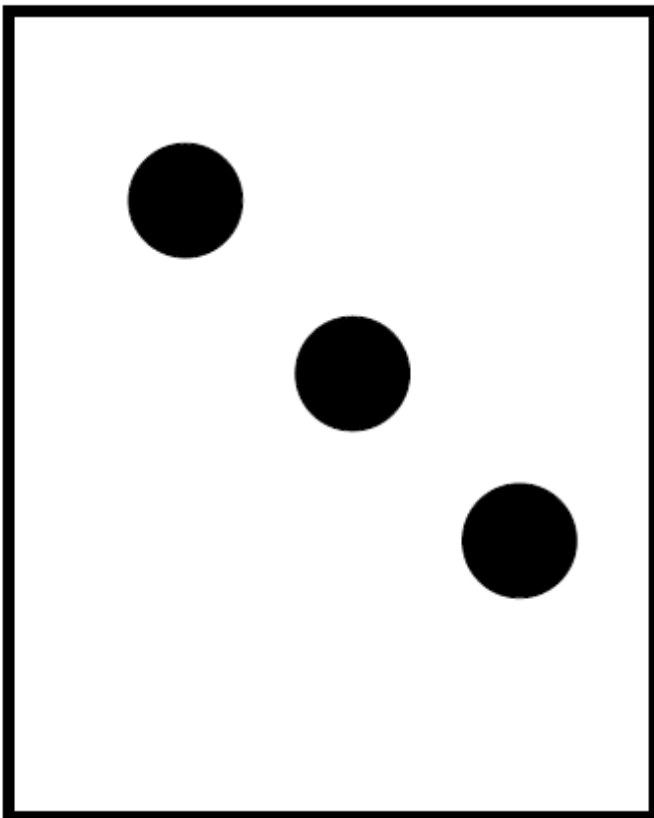
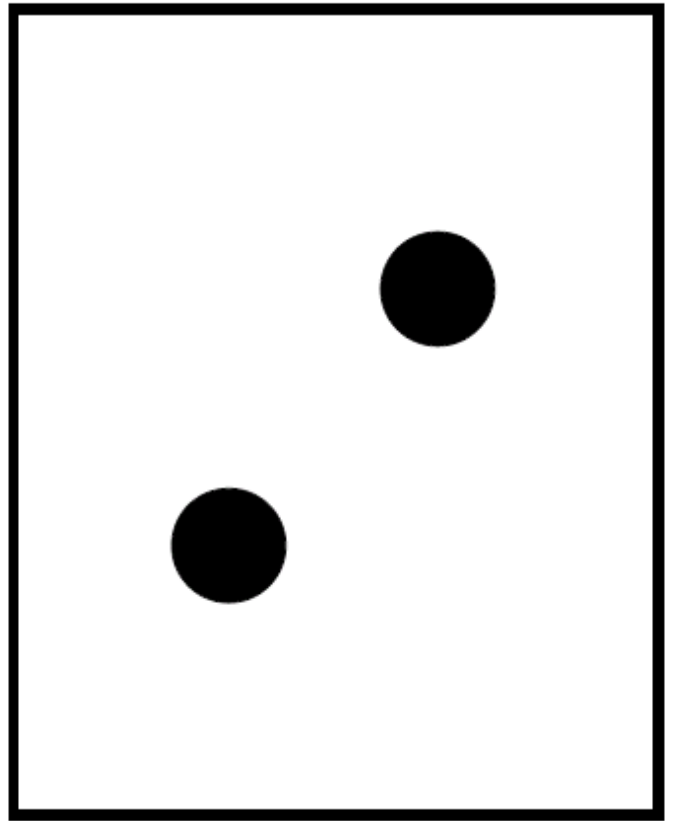
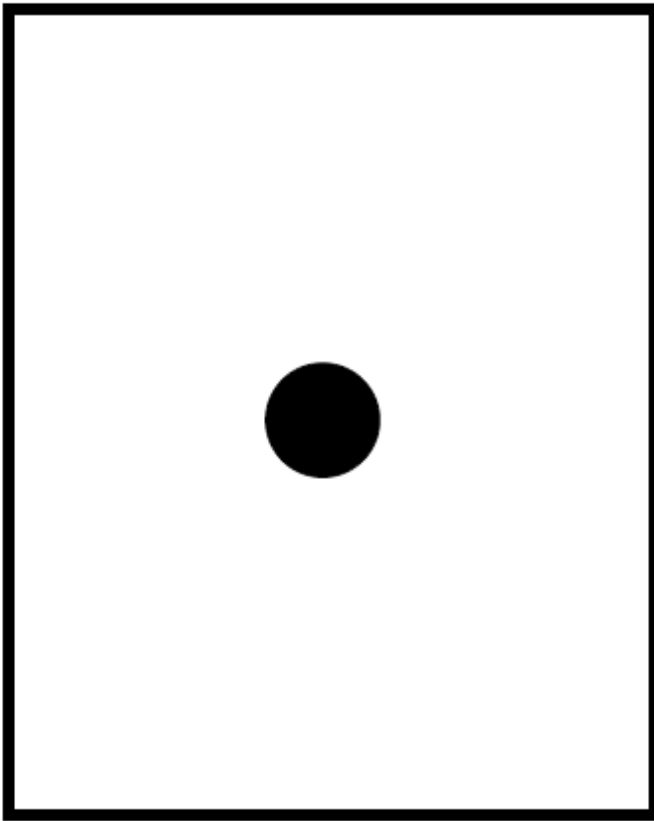
5

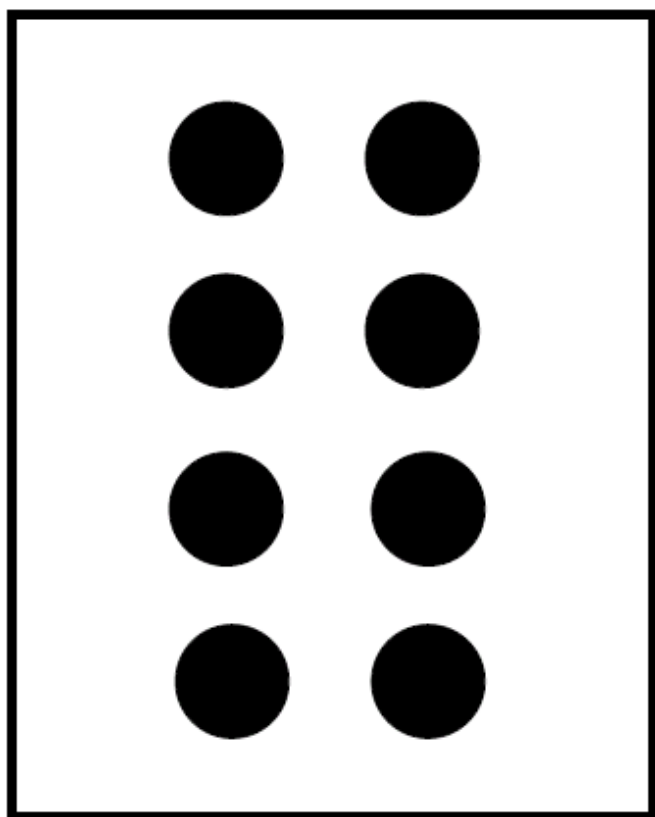
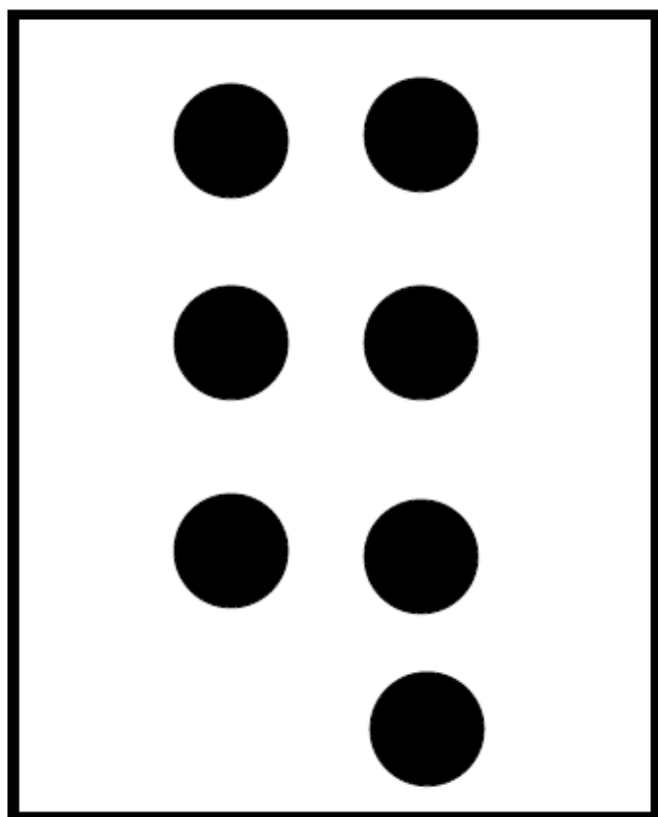
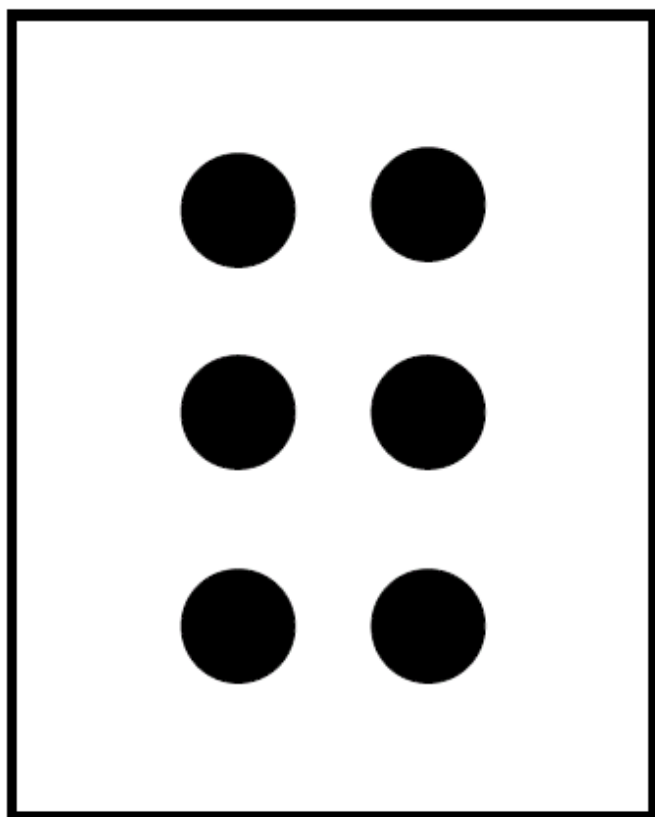
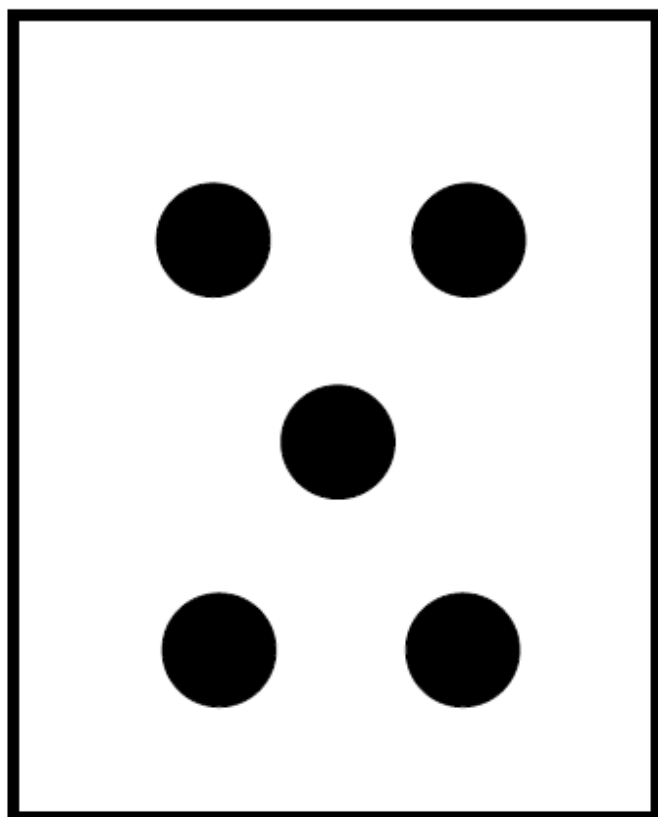


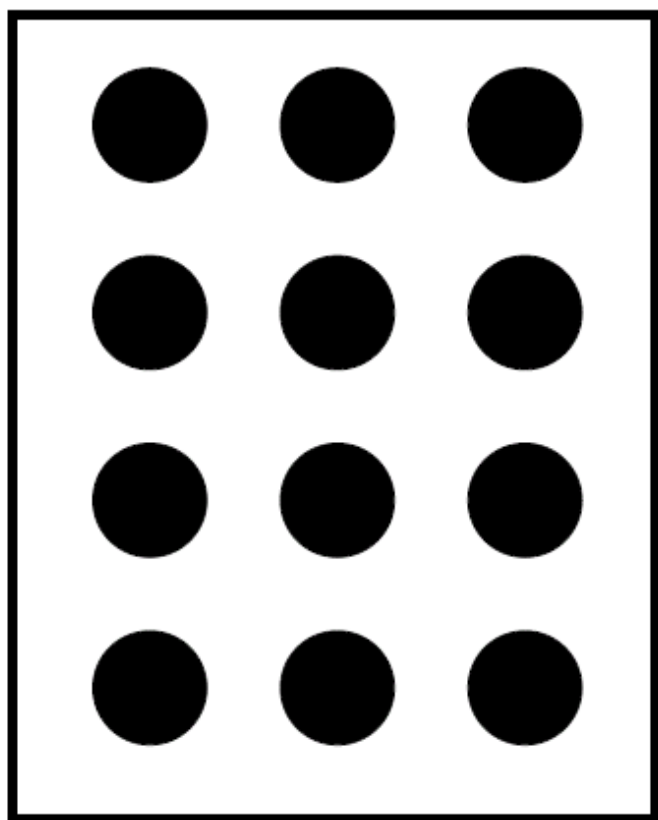
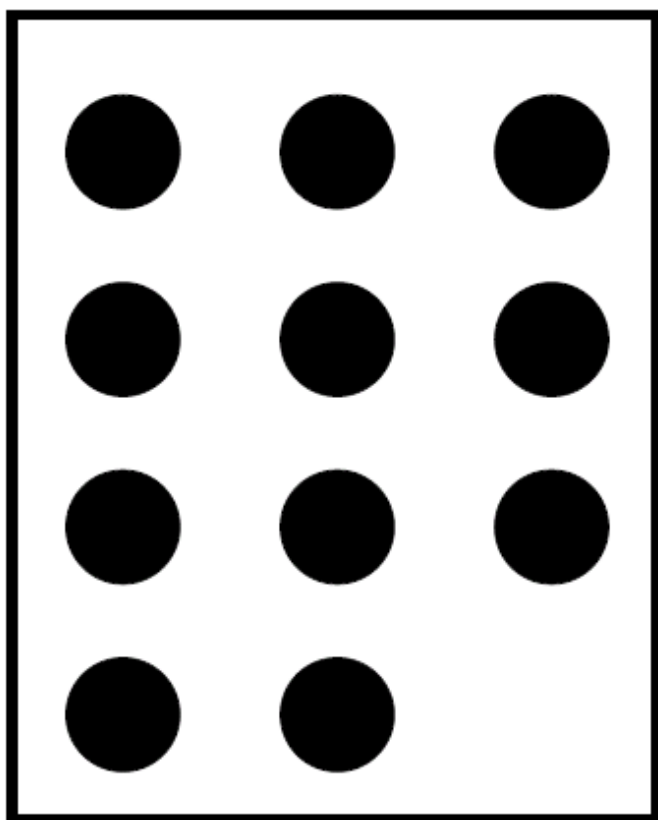
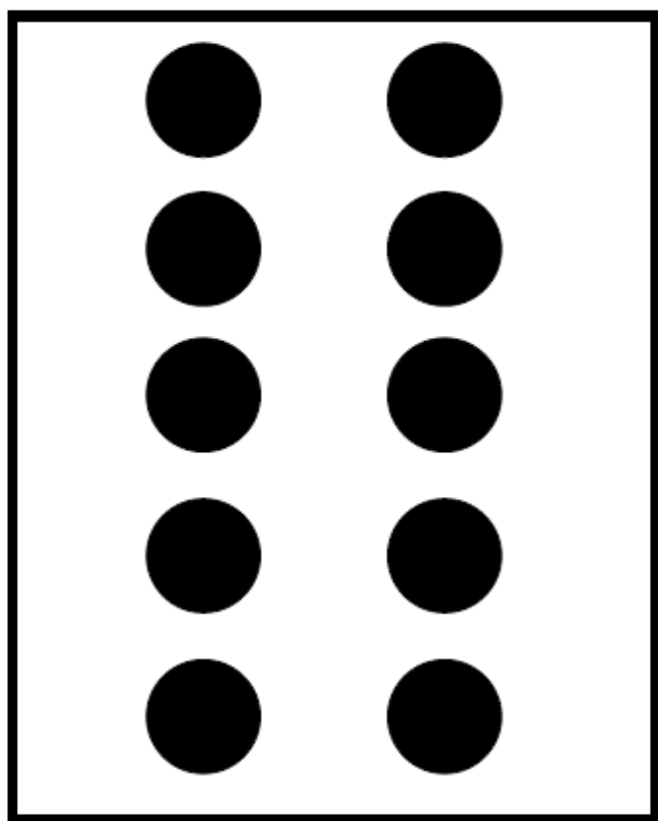
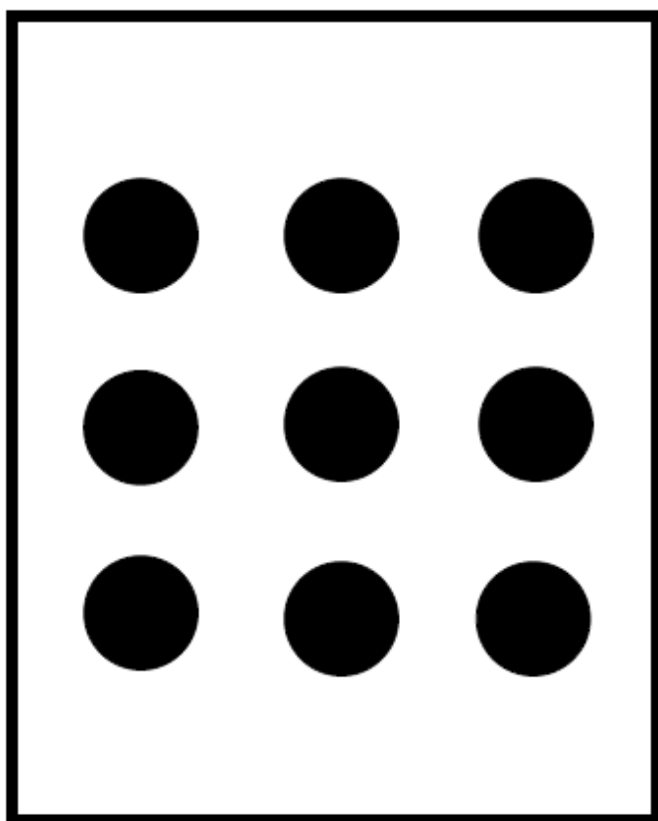
Materials: numeral cards (0-10), dot cards

1. Turn over a numeral card
2. How many pairs of dot cards can you find to equal this number?
3. Record your work.
4. Repeat with another number.

Dot Cards 1-12







0

1

2

3

4

5

6

7

8

9

10

True or False?

True	False
$6 = 4 + 2$	$5 + 2 = 8$

Materials: equation cards, True or False Board

1. Work with a partner. Take turns to turn over a card and decide whether the equation is true or false.
2. Place the card on the board. Explain why you think the equation is true or false.

I think this equation is
false because

I think this equation is
true because

3. Keep taking turns until you have placed all the cards on the board.

True	False

$$4 + 2 = 6 \quad 9 = 6 + 3 \quad 5 + 2 = 7 \quad 8 + 2 = 9$$

$$4 + 3 = 8 \quad 5 = 0 + 6 \quad 8 - 2 = 6 \quad 5 = 9 - 5$$

$$6 - 3 = 3 \quad 5 - 2 = 4 \quad 7 - 3 = 5 \quad 7 = 9 - 2$$

$$3 + 2 = 5 \quad 6 = 5 + 1 \quad 5 + 3 = 8 \quad 7 + 2 = 8$$

$$6 = 4 + 4 \quad 5 + 4 = 8 \quad 7 - 2 = 5 \quad 8 - 4 = 4$$

$$6 = 9 - 3 \quad 6 - 2 = 5 \quad 7 = 6 - 1 \quad 9 - 4 = 6$$

$$4 + 1 = 1 + 4$$

$$7 = 7$$

$$2 + 1 = 3 + 0$$

$$5 + 1 = 3 + 2$$

$$5 + 3 = 4 + 3$$

$$2 + 7 = 8 + 3$$

$$5 - 1 = 6 - 2$$

$$2 - 0 = 4 - 2$$

$$6 - 3 = 9 - 6$$

$$5 = 4$$

$$3 - 1 = 8 - 7$$

$$4 - 2 = 8 - 5$$

Lesson 3: My Robotic Friends Jr.

Overview

Using a set of symbols in place of code, students will design algorithms to instruct a "robot" to stack cups in different patterns. Students will take turns participating as the robot, responding only to the algorithm defined by their peers. This segment teaches students the connection between symbols and actions, the difference between an algorithm and a program, and the valuable skill of debugging.

Purpose

This unplugged lesson brings the class together as a team with a simple task to complete: get a "robot" to stack cups in a specific design. This activity lays the groundwork for the programming that students will do throughout the course as they learn the importance of defining a clearly communicated algorithm.

Agenda

- [Warm Up \(5 min\)](#)
 - [Talking to Robots](#)
- [Activity \(30 min\)](#)
 - [Introduction and Modeling](#)
 - [Handy Rules:](#)
 - [Differentiation Options:](#)
 - [Programming Your Robots](#)
- [Wrap Up \(10 min\)](#)
 - [Journaling](#)

Teaching Guide

Warm Up (5 min)

Discussion Goal

The goal of this quick discussion is to call out that while robots may seem to behave like people, they're actually responding only to their programming. Students will likely refer to robots from movies and TV that behave more like humans. Push them to consider robots that they've seen or heard of in real life, like Roombas, or even digital assistants like Amazon Alexa.

Talking to Robots

Display: Watch one of the videos below to give students context for the types of things that robots can do:

- [Asimo by Honda \(3:58\)](#)
- [Egg Drawing Robot \(3:15\)](#)
- [Dancing Lego Robot \(1:35\)](#)

Discuss: Refer to the video that you chose and ask students how they think that the robot knew what to do. Does a robot really “understand” what you say? Is it worried about getting in trouble if it doesn't do what it's told?

Say: Robots can only do what they've been told to do, but we don't just tell them using words. In order to do something, a robot needs to have a list of steps that it can read. Today, we are going to learn what it takes to make that happen.

Activity (30 min)

**My Robotic Friends**
Symbol Key (Course B)

C	O
D	E



Pick Up Cup



Put Down Cup



Step Forward



Step Backward

Introduction and Modeling

Teaching Tip

Handy Rules:

- Up means that the cup automatically goes up as high as it needs to
 - Down means that it automatically goes down until it lands on something
 - The hand automatically returns to cup stack after setting down a cup
 - Forward means the robot moves one step (1/2 cup width) forward
 - Backward means the robot moves one step (1/2 cup width) Backward
 - Note: Students may not use backward at this age unless they want to build the cup stacks in reverse (which is also okay)
 - Programmers are not allowed to talk when the robot is working. This includes blurting out answers or pointing out when the robot has done something wrong
 - Programmers should raise their hand if they see a bug
-

Differentiation Options:

Simplify: Does this all feel a little complicated for your students?

Don't forget to model this in front of the class until students understand all of the rules. If it's still confusing, try running this whole activity together as a classroom using volunteers as robots, instead of breaking up into groups!

Intensify: Are your students more advanced? Do you want this lesson to relate more closely to the online puzzles? Here are some modifications that you can make:

- One arrow corresponds to one movement
 - When a cup is removed from the stack, it returns to table-level before moving
 - Students need to use multiple "up" arrows to lift the cup multiple levels
 - Students need to use multiple "down" arrows to lower the cups multiple levels
 - Students need to use the "back" arrows to get back to the cup stack

Set Up: Have stacks of cups or cut paper trapezoids available for groups.

Display: Display My Robotic Friends - Symbol Key or write the allowed actions on the board - make sure these are in a place where they can be seen for the whole activity. Explain to the class that these will be the only four actions that they can use for this exercise. For this task, they will instruct their "robot" friend to build a specific cup stack using only the commands listed on the key.

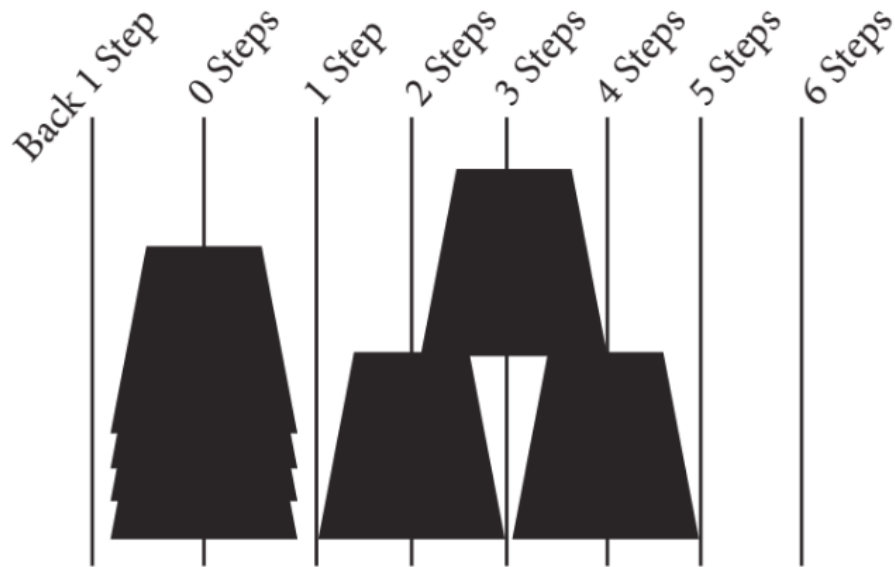
Model: In order to explain how the instructions are intended to work, model for the class how to create and follow an algorithm for replicating a simple pattern. Place a single stack of cups in front of you to start.

Display: Hold up the pattern you plan to model. A simple three cup pattern is a great place to start.



Prompt: Ask the class what the first instruction should be, using only the four instructions allowed. The first move should be to "pick up cup." If students suggest something else from the list, perform that action and allow them to see their error. If they suggest something not from the list, make a clear malfunction reaction and let them know that the command is not understood.

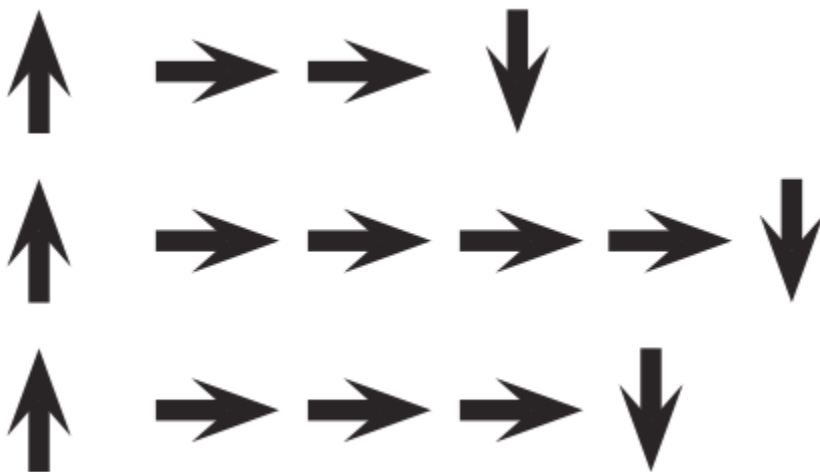
With cup in hand, ask the class to continue giving you instructions until the first cup is placed. This is a great place to clarify that "step forward" and "step backward" each imply moving half a cup width. See the image below for reference.



Continue asking for instructions from the classroom until you have completed the entire design.

Once your stack is complete, point out that they just gave you a list of steps for completing a task. That's an algorithm. Algorithms are great for sharing ideas, but spelling them out word by word can take a long time. That's what the symbols are for! When you change an algorithm into symbols that a robot (or computer) understands, that's called programming.

Ask the class to help you write the "program" for that first move by changing the text into an arrow. Then work with them to write down the rest of the moves necessary to complete the pattern. Depending on the confidence of your students, you might switch back and forth frequently between acting as the "robot" and writing down the code, or you might push them to write the whole program before you will implement it. One possible solution looks like this:



Volunteer: Once the class has completed the model program, ask one of the students to come up and act as the "robot" to ensure that the program really works. Encourage them to say the instructions out loud as they "run" the code.

Programming Your Robots

Group: Place students into groups of 4. Each group should then further break down into two pairs - each pair will develop their own program to be "run" by the other pair.

Distribute: Give each group one stack of cups or paper cutouts.

Display: Show My Robotic Friends - Cup Stacking Ideas to the class or hand out individual copies for groups to use. Have each pair (not group) choose which idea they would like their robots to do. Try to push for an easier idea for the first time, then have them choose a more complex design later on. Encourage pairs to keep their choice secret from the other half of their group.

Discuss: Give each pair time to discuss how the stack should be built, using only the provided symbols. Make sure each group writes down the "program" somewhere for the "robot" to read later.

Do: Once both of the group's pairs have completed their programs, they can take turns being "robots" for each other by following the instructions the other pair wrote. Encourage students to watch their "robot" closely to ensure that they are following instructions. If a student sees a bug and raises their hand, have the robot finish the instructions to the best of their ability. Afterward, have the students discuss the potential bug and come up with solutions. Continue repeating until the stack is built properly.

Circulate: Look for groups who are trying to take shortcuts by adding extra things (like numbers) to their code. Praise them for their ingenuity, but remind them that for this exercise, the robots do not understand anything but the provided symbols. If you like, you can hint that they should save their brilliant solution for the next time they play this game, since they might get the chance to use their invention soon!

Iterate: Depending on the time available, mix up the pairs and give them a chance to do a different pattern. Each time groups repeat the process, encourage them to choose a more challenging pattern.

Discussion Goal

Sense making: The goal of this discussion is to give students space to make sense of their experience both as robot and programmer. The questions are intentionally broad, but designed to get students thinking about the challenges of writing a clear program and the constraints of a robot or computer in interpreting your instructions.

Discuss: After everyone has had a chance to be the robot, bring the class back together to discuss their experience. In particular, discuss as a class:

- What was the most difficult part of coming up with the instructions?
- Did anyone find a bug in your instructions once your robot started following them?
 - What was the bug?
 - Why do you think you didn't notice it when writing the program?
- When you were the robot, what was the hardest part of following the instructions you were given?

Wrap Up (10 min)

Journaling

Having students write about what they learned, why it's useful, and how they feel about it can help solidify any knowledge they obtained today and build a review sheet for them to look to in the future.

Journal Prompts:

- Draw one of the Feeling Faces - Emotion Images that shows how you felt about today's lesson in the corner of your journal page.
- Draw your own stack of cups that you would like to see a robot build.

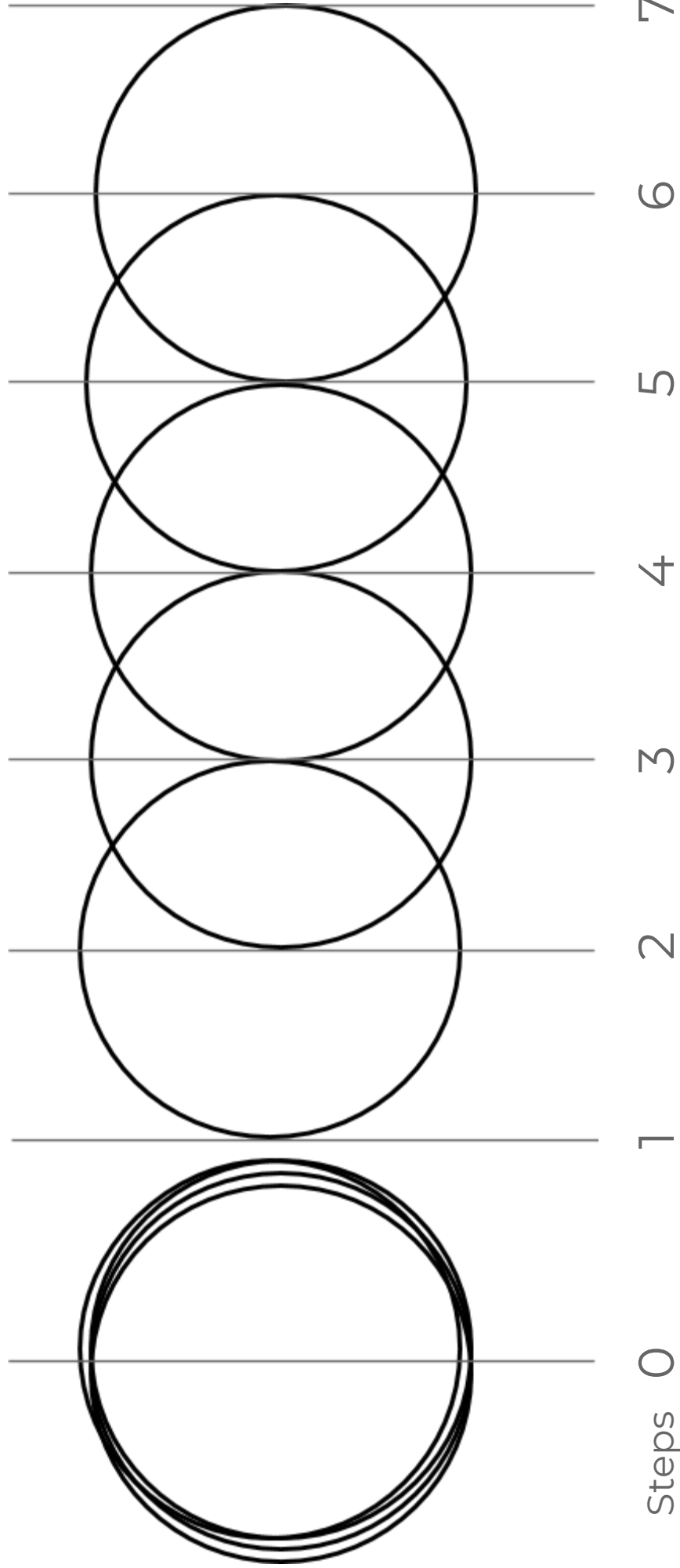
- Can you create a program for that cup stack?

My Robotic Friends

Cup Spacing



CUP STACK





Great



Good



Okay



Bad



Sad



Angry



Frustrated



Confused

My Robotic Friends

Symbol Key



Pick Up Cup



Put Down Cup



Step Forward



Step Backward

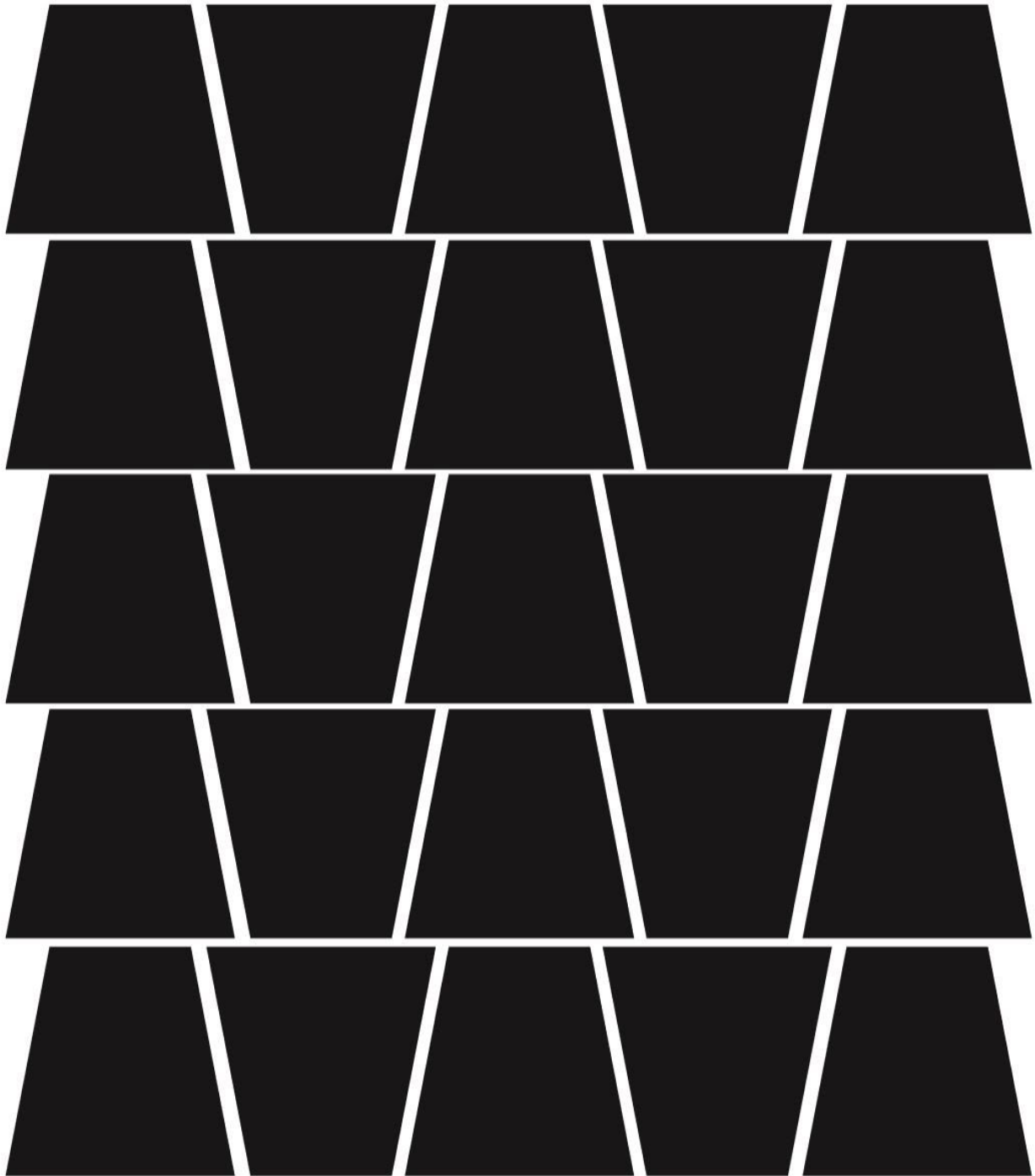
My Robotic Friends

Paper Trapezoids



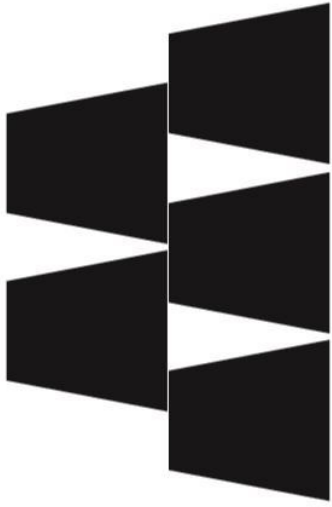
To cut quickly:

First cut in horizontal strips, then snip along lines to make trapezoids.



My Robotic Friends

Cup Stack Ideas



My Robotic Friends

Cup Stack Ideas

