TexasHomeLearning

First Grade

Eight-Week Learning Plan

Everything you need to provide lessons at home.

1701 N. Congress Ave, Austin, TX • (512) 463-9734 • info@tea.texas.gov

Texas Education Agency

Welcome Texas families! This packet is designed to support at-home learning by providing parents and students with everything they need to get started and follow an easy-to-use daily plan.

What's included for you:

- Eight weeks of planned at-home learning
- Set-up instructions
- Daily and weekly schedules
- Daily easy to follow lessons and resources for all subjects

Packet Contents

Section	Contents
Parent Instructions	• Overview summary of home learning goals • Establish your daily schedule • Recommended schedule for grade level • Daily guidance for learning
Phonics	• Amplify Phonological Awareness Activities
Reading and Writing	• Talking About Forces • Room 4 Solves a Problem • Forces in Ball Games • Building from Forces • Busy Day in Pushville
Math	• Zearn word problems • Problem sets
Science	• Engineering and Design Process background information • Making Observations background information • Science Projects background information
Social Studies	• Reading Maps background information

Overview Summary of Home Learning Goals

Over the next several weeks of going through the home learning schedule, your student will be learning or reviewing important grade level content to keep skills sharp while schools are closed. Students should spend time each day following the recommended schedule, doing reading, math and science or social studies. There is also built-in choice learning time for students.

Content	Overview of learning	Parent Role
Phonics	Students will complete a daily phonics lesson using the included Amplify activities.	Students will need the support of a family member for these easy to follow programs.
Reading and Writing	Students should read every day and follow an enjoyable **at-home reading routine**: choose a book to read, talk about the book with a family member, and write about the book or respond to a prompt. Choosing books of interest at home is encouraged, and some additional printed book options may be available.	Parents will need to help students set up and reinforce a daily reading routine. This includes getting some additional books at home, including with district support as needed. A daily printable books option is included. Parents may need to support students reading depending on the book selected.
Math	Students will solve a daily word problem then complete a problem set (worksheet). These problems are on foundational skills for 1st grade math: place value, measurement, and addition and subtraction.	Parents may need to read the daily word problem and problem set students and help students solve the problems, or students may be able to do so independently. Have objects available that students could count to help them solve the problems (pennies, blocks, cereal pieces – whatever is available at home!). Allow them to solve the problems in any way that makes sense to them, even if it is different than what is shown on the page.
Science/Social Studies	Students will engage in a daily activity that is focused on science or social studies. These activities have suggestions for using common materials found in the home or outside such as paper, pencil, and common objects.	Parents may need to read the activity to their student and provide access to materials for suggested activities. Background information is provided to support families with understanding content.
Choice Learning	Students should choose one or more activities each day that are fun and interesting to them. This could be reading another book, counting or sorting objects at home, doing a puzzle, or building with blocks or Legos.	Parents do not need to support with choice learning time.

Establish Your Daily Schedule

We recognize that many caregivers are balancing overseeing home learning with many other priorities. This sample schedule provides the recommended amount of time students should spend learning in each subject based on their grade level. Families can adjust this schedule to meet their individual needs but establishing a consistent daily schedule for students is strongly encouraged. After establishing a schedule with students, use the guidance in daily instructions that can be used for all learning activities.

Recommended Schedule for Grade Level:

Time	**Activity**
8:00-9:00	Outdoor or Indoor Exercise Time
9:00-10:00	Reading and Writing
10:00-10:30	Snack and Break
10:30-11:30	Math
11:30-12:00	Lunch Time
12:00-12:30	Quiet Time
12:30-1:00	Science or Social Studies
1:00-1:15	Break
1:15-1:45	Choice Learning Time
1:45-2:30 pm	Outdoor or Indoor Exercise
2:30 – 3:00 pm	Art or Play Time

Daily Guidance for Learning

Week 1	Time	Packet Section	Guidance for Learning
Monday	8:00- 9:00 am		Outdoor or indoor exercise time
	9:00- 9:20 am	Phonics	Find Specific Sound • Found in the Phonological Awareness pages. • Read the instructions for the activity. Use the instructions to reinforce and practice segmenting individual sounds.
	9:20- 10:00 am	Reading and Writing	Set-up the at-home reading routine by: 1) Choosing a book. • Book of interest at home **OR** • Book in packet- Talking About Forces 2) Discussing the book. • What is a new thing you learned from the book? 3) Writing about the book. • Draw and write about what you learned.
	10:00- 10:30 am		Have a snack and take a break
	10:30- 11:30 am	Math	• Read the Zearn word problem for Lesson 1 to your child and support as they solve using the example provided. • Have your child complete the Lesson 1 problem set independently or with your support.
	11:30- 12:00 pm		Lunch time
	12:00- 12:30 pm		Rest, relax, or read a book quietly
	12:30- 1:00 pm	Science	• Read the Engineering and Design Process Background Information. Then talk to your child about the engineering and design process. • Have your child to look at their toothbrush and think about how the design of the toothbrush could be improved. • Ask your child to draw a picture of the improved toothbrush design. Then have your child explain how the new design makes the toothbrush better.
Tuesday	8:00- 9:00 am		• Outdoor or indoor exercise time
	9:00- 9:20 am	Phonics	Match the First Sound • Found in the Phonological Awareness pages. • Read the instructions for the activity. Use the instructions to reinforce and practice segmenting individual sounds.
	9:20- 10:00 am	Reading and Writing	Set-up the at-home reading routine by: 1) Choosing a book. • Book of interest at home **OR** • Book in packet- Room 4 Solves a Problem 2) Discussing the book. • What is a new thing you learned from the book? 3) Writing about the book. • Draw and write about what you learned.

	10:00- 10:30 am		• Have a snack and take a break
	10:30- 11:30 am	Math	• Read the Zearn word problem for Lesson 2 to your child and support as they solve using the example provided. • Have your child complete the Lesson 2 problem set independently or with your support.
	11:30- 12:00 pm		• Lunch time
	12:00- 12:30 pm		• Rest, relax, or read a book quietly
	12:30- 1:00 pm	Science	• Read the Making Observations Background Information. Then talk to your child about making observations. • Have your child to look or go outside and observe the what they see, hear, and smell (ex. plants, animals, buildings, etc.) • Ask your child to make five observations and draw a picture of what was observed.
Wednesday	8:00- 9:00 am		• Outdoor or indoor exercise time
	9:00- 9:20 am	Phonics	Mystery Game • Found in the Phonological Awareness pages. • Read the instructions for the activity. Use the instructions to reinforce and practice segmenting individual sounds.
	9:20- 10:00 am	Reading and Writing	Set-up the at-home reading routine by: 4) Choosing a book. • Book of interest at home **OR** • Book in packet- <u>Forces in Ball Games</u> 5) Discussing the book. • What is a new thing you learned from the book? 6) Writing about the book. • Draw and write about what you learned.
	10:00- 10:30 am		• Have a snack and take a break
	10:30- 11:30 am	Math	• Read the Zearn word problem for Lesson 3 to your child and support as they solve using the example provided. • Have your child complete the Lesson 3 problem set independently or with your support.
	11:30- 12:00 pm		• Lunch time
	12:00- 12:30 pm		• Rest, relax, or read a book quietly
	12:30- 1:00 pm	Science	• Read the Science Projects Background Information. Then talk to your child about science projects. • Ask your child to observe a person, animal, plant, or object. • Ask your child to make a drawing of five different observations about the person, animal, plant, or object. • Have your child describe the five observations to another person to see if the person can guess what is being described.

			Optional: Plan a science project together.
Thursday	8:00- 9:00 am		• Outdoor or indoor exercise time
	9:00- 9:20 am	Phonics	Word Race • Found in the Phonological Awareness pages. • Read the instructions for the activity. Use the instructions to reinforce and practice segmenting individual sounds.
	9:20- 10:00 am	Reading and Writing	Set-up the at-home reading routine by: 7) Choosing a book. • Book of interest at home **OR** • Book in packet- <u>Building with Forces</u> 8) Discussing the book. • What is a new thing you learned from the book? 9) Writing about the book. • Draw and write about what you learned.
	10:00- 10:30 am		• Have a snack and take a break
	10:30- 11:30 am	Math	• Read the Zearn word problem for Lesson 4 to your child and support as they solve using the example provided. • Have your child complete the Lesson 4 problem set independently or with your support.
	11:30- 12:00 pm		• Lunch time
	12:00- 12:30 pm		• Rest, relax, or read a book quietly
	12:30- 1:00 pm	Social Studies	• Read the Reading Maps Background Information. Then talk to your child about reading maps. • Have your child hide an object in the home. • Then have your child make a map for someone to follow to find the treasure.
Friday	8:00- 9:00 am		• Outdoor or indoor exercise time
	9:00- 9:20 am	Phonics	Count the Sounds • Found in the Phonological Awareness pages. • Read the instructions for the activity. Use the instructions to reinforce and practice segmenting individual sounds.
	9:20- 10:00 am	Reading and Writing	Set-up the at-home reading routine by: 10) Choosing a book. • Book of interest at home **OR** • Book in packet- <u>Busy Day in Pushville</u> 11) Discussing the book. • What is a new thing you learned from the book? 12) Writing about the book. • Draw and write about what you learned.
	10:00- 10:30 am		• Have a snack and take a break
	10:30- 11:30 am	Math	• Read the Zearn word problem for Lesson 5 to your child and support as they solve using the example provided.

			• Have your child complete the Lesson 5 problem set independently or with your support.
	11:30- 12:00 pm		• Lunch time
	12:00- 12:30 pm		• Rest, relax, or read a book quietly
	12:30- 1:00 pm	Science	• Have your child draw a map of their room (or another room in the home). • Ask your child to identify five details in the room to include on the map. • Have your child measure the distance between details in the room (Ex. chair and window) by counting the number of steps between. Have them write the distance (number of steps) on the map.

Phonics

Amplify.

Phonological Awareness

Before being able to read written letters and words, children learn to hear the individual sounds in spoken words. For example, beginning readers with phonemic awareness are able to hear and recognize that the word "cat" is made up of the sounds /c/ /a/ /t/. They can also combine or blend the separate sounds of a spoken word to say the word ("/d/ /o/ /g/ → dog"). Phonological Awareness activities provide practice in segmenting individual sounds in spoken words and blending sounds to say the word.

Use these activities to reinforce and practice phonological awareness skills with your child.

Title	Suggested Grade(s)	Target Skill(s)	Activity
Find Specific Sounds	K–2	Isolate Beginning and Ending Sound	Have your child and other family members listen for words with a specific sound in family conversation or on television and radio programs, such as words that start with the *s* sound or that end with the *k* sound. Have your family members share their heard words and list them on a piece of paper.
Match the First Sound	K–2	Isolate Beginning Sound	Help your child identify the beginning sounds in words. Sort and match pictures and words according to beginning sound. Ask your child to figure out which picture or word doesn't belong because it has a different beginning sound. (Example: *bag*, *nine*, *beach*, and *bike*). Sing the television jingle, "One of these things is not like the others." Have your child sort snack foods by their beginning sounds. (Example: raisins on one plate, carrots on another, etc.)
Mystery Game	K–2	Isolate Beginning Sound	Play a mystery game in which you are calling your child's name or looking for an object around the house. For example, say, "I'm thinking of someone whose name begins with (say the sound for the letter *t*)," or "I'm looking for an item that begins with (say the sound for the letter *g*)."

(continues on the next page)

Word Race	K–2	Isolate Beginning Sound	Help your child pick out the first sound in words, an important step in learning to read. Give your child one minute to name as many objects, people, foods, etc that start with a given sound, such as *sss*. When the minute is up, have them try to beat their score with another sound, such as *rrr*. It's important to say the sound the letter makes rather than the letter's name. For instance, say *mmm* rather than em.
Count the Sounds	K–2	Segment Sounds in Words, Counting Sounds in Words	Help your child count the number of sounds in words. Have your child find pictures of two– and three–sound words. Put the same number of markers (coins, blocks, etc.) representing the sounds under the picture. Have your child touch a different marker as he or she says each sound. Some ideas for pictures are: fish (3 sounds), lip (3 sounds), shoe (2 sounds), and the number five (3 sounds).
Sounds on a Walk	K–2	Segment Sounds in Words, Counting Sounds in Words	Help your child take spoken words apart. Have your child listen for syllables in words. You can play this game while you are walking. Have your child clap the number of syllables in the name of each object you see. Next, have your child separate the sounds in words, listening for beginning, middle, and ending sounds; for example, if your child sees a bird, he or she would say *b–ir–d*.
Break the Words Apart	K–2	Segment Sounds in Words, Isolate Beg/Mid/End Sounds in Words, Blending Sounds	Help your child take spoken words apart and put them together. Have your child separate the sounds in simple three–letter words, listening for beginning, middle, and ending sounds. For example, pronounce *mom* as follows: *mm–o–mm*. Next, ask your child to blend sounds together to make a word. Say words one sound at a time; for example, you say *sh–ee–p* and your child says *sheep*.

(continues on the next page)

Shopping For Sounds	K–2	Segment Sounds in Words, Isolate Beg/Mid/End Sounds in Words, Blending Sounds	As you and your child shop, have your child separate the sounds in the name of each item you put in your shopping basket, listening for beginning, middle, and ending sounds; for example, for a bag, your child would say *b–a–g*. Next, ask your child to blend sounds together to make a word. Say words one sound at a time; for example, you say *m–i–l–k* and your child says *milk*; you say *c–a–n* and your child says *can*.
Count the Words	K–2	Word Counting	Have your child count the number of words in a spoken sentence. Say a sentence. (Example: "Let's go to the park.") Have your child tell you the number of words in the sentence. Switch roles, allowing your child to give you a sentence and have you say the number of words it contains.

Reading and Writing

Talking About Forces

by Andrew Falk and Jennifer Tilson

Materials to be used solely for remote learning due to COVID-19

Talking About Forces

by Andrew Falk and Jennifer Tilson

Materials to be used solely for remote learning due to COVID-19

These materials are based upon work partially supported by the National Science Foundation under grant numbers DRL-1119584, DRL-1417939, ESI-0242733, ESI-0628272, ESI-0822119. The Federal Government has certain rights in this material. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

These materials are based upon work partially supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A130610 to The Regents of the University of California. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

Developed by the Learning Design Group at the University of California, Berkeley's Lawrence Hall of Science.

Amplify Science Elementary is based on the *Seeds of Science/Roots of Reading*® approach, which is a collaboration between a science team led by Jacqueline Barber and a literacy team led by P. David Pearson.

www.scienceandliteracy.org

Amplify.
55 Washington Street, Suite 800
Brooklyn, NY 11201
1-800-823-1969
www.amplify.com

Grade K
Talking About Forces
ISBN: 978-1-939787-92-7

Materials to be used solely for remote learning due to COVID-19

It was a beautiful day at the park! Everywhere you looked, there were kids making things move.

We have many ways of talking about what happens when one thing makes another thing move.

Scientists and **engineers** have their own way of **explaining** what is happening. They talk about **forces**. They say that when one thing makes another thing move, it **exerts** a force on it.

Let's see some examples!

Scott pushed Francis on the swing, and Francis moved. She sailed forward in the swing, high into the air.

What would a scientist or engineer say happened here?

Here is what a scientist or engineer would say:

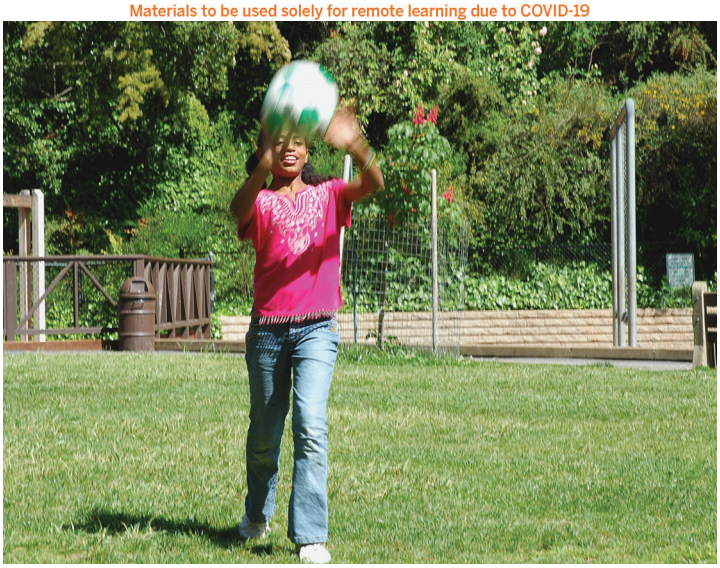
Francis moved because Scott exerted a force on her.

Faheem jumped into the wagon and asked for a ride. Francis pulled on the handle of the wagon, and the wagon rolled up the hill with Faheem in it!

What would a scientist or engineer say happened here?

Here is what a scientist or engineer would say:

The wagon and Faheem moved because Francis exerted a force on the wagon.

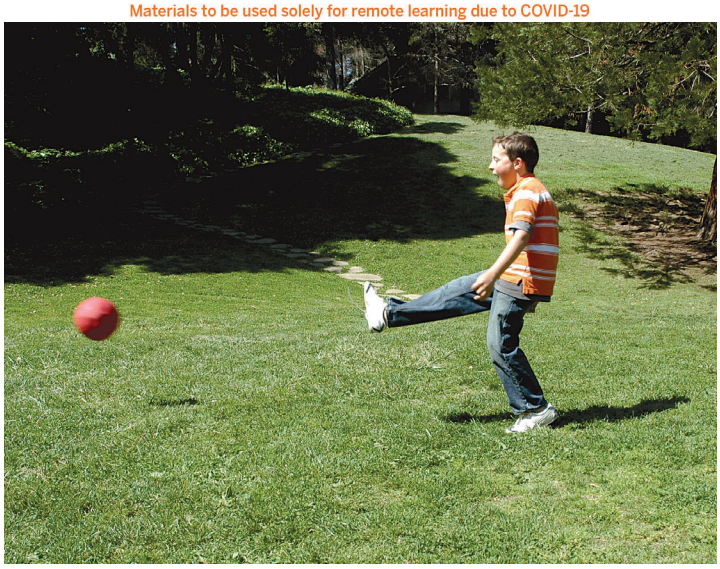


Mia and Scott played catch in the field. When it was her turn to throw, Mia threw the ball and it flew away from her.

What would a scientist or engineer say happened here?

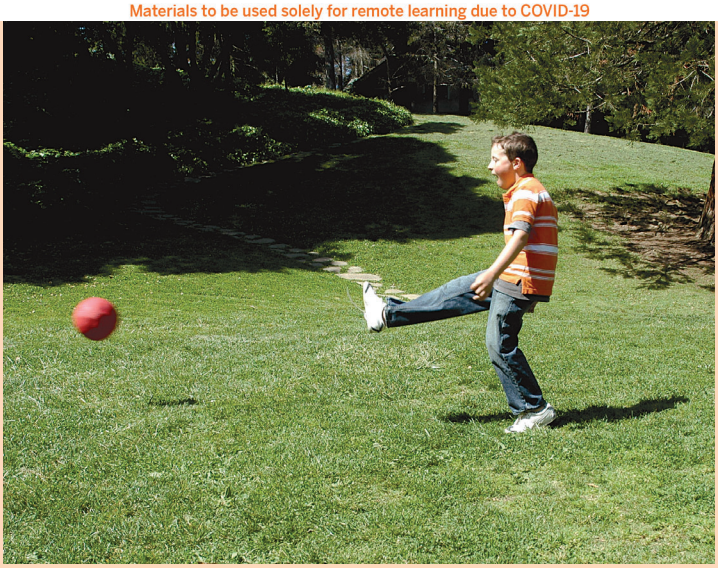
Here is what a scientist or engineer would say:

The ball moved because Mia exerted a force on the ball.



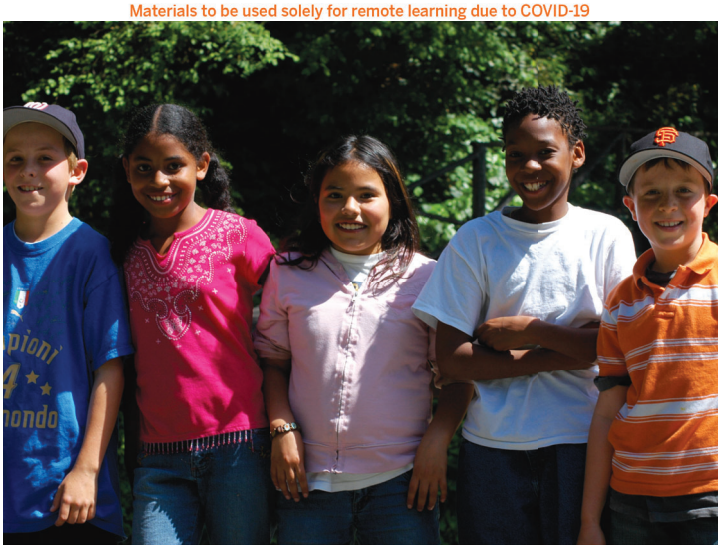
Another ball was sitting on the grass. Jess ran up and kicked the ball. Wham! The ball bounced away over the grass. Jess scored a goal!

What would a scientist or engineer say happened here?



Here is what a scientist or engineer would say:

The ball moved because Jess exerted a force on the ball.



The kids had fun playing in the park and making things move. A scientist or engineer would agree that they had fun playing in the park. A scientist or engineer might also say they exerted forces on lots of **objects** in the park!

Scientists and engineers know that any time you see an object start to move, it is because another object exerted a force on it. When you see one object start to move, look for the other object that made it move. Forces always happen between two objects.

Here are more pictures of objects exerting forces on other objects.

The snowplow shoved the snow, and the snow moved forward along the road.

The grandma pushed the grandpa's chair, and the chair rolled along the sidewalk.

The hammer pounded the nail, and the nail moved down into the wood.

The bird tugged on the worm, and the worm slid up out of the sand.

The dog dragged the sled, and the sled slipped across the snow.

What is another way to say what happened in these pictures? How would a scientist or engineer say it?

Look at each picture and think about these questions: What object moved? What object exerted a force on it, making it move?

Glossary

engineer: a person who makes something to solve a problem

exert: to cause a force to act on an object

explain: to describe how something works or why something happens

force: a push or a pull

object: a thing that can be seen or touched

scientist: someone who learns about the natural world

Materials to be used solely for remote learning due to COVID-19

Books for *Pushes and Pulls*:
Talking About Forces
Building with Forces
Room 4 Solves a Problem
A Busy Day in Pushville
Forces in Ball Games

Lawrence Hall of Science:
Program Directors: Jacqueline Barber and P. David Pearson
Curriculum Director, Grades K–1: Alison K. Billman
Curriculum Director, Grades 2–5: Jennifer Tilson

Lead Book Developers: Ashley Chase and Chloë Delafield

***Pushes and Pulls* Book Development Team:**
Joan Carey, Kate Donaldson-Fletcher, Andrew Falk, Sophia Lambertsen, Meredith W. Moran, Elizabeth Shafer

Amplify:
Irene Chan, Samuel Crane, Shira Kronzon, Charvi Magdaong, Thomas Maher, Rick Martin, Matt Reed, Eve Silberman, Steven Zavari

Design and Production: Fran Biderman-Gross, advantages.net

Credits:
Photographs: Cover, Pages 1, 5–13: Steve Dunphy; Page 3: Bec Parsons/DigitalVision/Getty Images; Page 4: Todd Warnock/DigitalVision/Getty Images; Pages 14 (t, b), 15 (b): Shutterstock; Page 14 (m): Susan Chiang/E+/Getty Images; Page 15 (t): © iStock.com/outtakes

Materials to be used solely for remote learning due to COVID-19

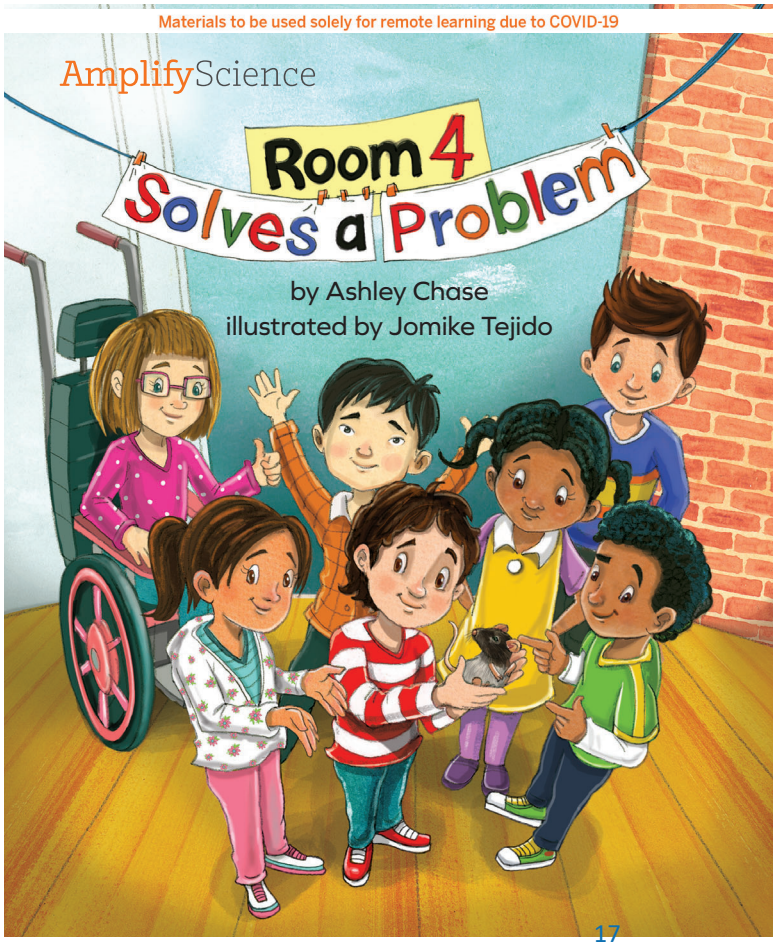
Pushes and Pulls

Scientists and engineers have a special way of saying how things happen.

When Scott pushes Francis on the swing, a scientist or engineer would say that Scott is exerting a force on Francis. Find out how a scientist or engineer would describe different things happening in the park.

THE LAWRENCE HALL OF SCIENCE
K
Amplify. Published and Distributed by Amplify.
www.amplify.com
ISBN 978-1-939787-92-7

Materials to be used solely for remote learning due to COVID-19



Room 4 Solves a Problem

by Ashley Chase
illustrated by Jomike Tejido

Materials to be used solely for remote learning due to COVID-19

These materials are based upon work partially supported by the National Science Foundation under grant numbers DRL-1119584, DRL-1417939, ESI-0242733, ESI-0628272, ESI-0822119. The Federal Government has certain rights in this material. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

These materials are based upon work partially supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A130610 to The Regents of the University of California. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

Developed by the Learning Design Group at the University of California, Berkeley's Lawrence Hall of Science.

Amplify Science Elementary is based on the *Seeds of Science/Roots of Reading*® approach, which is a collaboration between a science team led by Jacqueline Barber and a literacy team led by P. David Pearson.

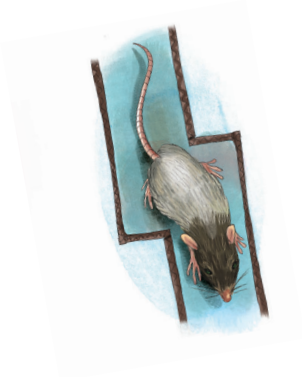
www.scienceandliteracy.org

Amplify.
55 Washington Street, Suite 800
Brooklyn, NY 11201
1-800-823-1969
www.amplify.com

Grade K
Room 4 Solves a Problem
ISBN: 978-1-943228-62-1

Materials to be used solely for remote learning due to COVID-19

Contents



Materials to be used solely for remote learning due to COVID-19

Ratty's Problem

Everybody in Room 4 loved having a pet rat. All the kids took turns feeding Ratty and cleaning his cage. During choice time, somebody always chose to play with Ratty. So when Mr. S told the kids that Ratty had a problem, all the kids were concerned.

"I took Ratty to the **vet** for a check-up," said Mr. S. "She told me Ratty needs to **exercise**. He needs to move around and play more."

Omar raised his hand. "I'll play with Ratty!"

"That's great!" said Mr. S. "We can all play with Ratty more often. But the vet said Ratty *also* needs to have ways to exercise when he's by himself in his cage."

The class decided to think of **solutions** to Ratty's exercise problem. They decided to **design** new exercises for Ratty.

"What kinds of exercises can you think of?" Mr. S asked. "**Visualize** some exercises that you've tried. Picture them in your mind." The kids visualized pull-ups, soccer, weightlifting, and more.

Once they told Mr. S their ideas, he said, "Those are all exercises for humans. Rats can't do those human exercises exactly, but rats do **exert forces** when they exercise, just like humans do."

Then Mr. S said, "Maybe we can visualize other kinds of pushes and pulls Ratty could do for exercise. Picture Ratty pushing and pulling."

That night, each student agreed to design some exercises for Ratty. They decided to make drawings to help them visualize their exercises.

Planning Solutions

The next day, the students shared their solutions to Ratty's exercise problem. They showed their drawings of ways for Ratty to exercise.

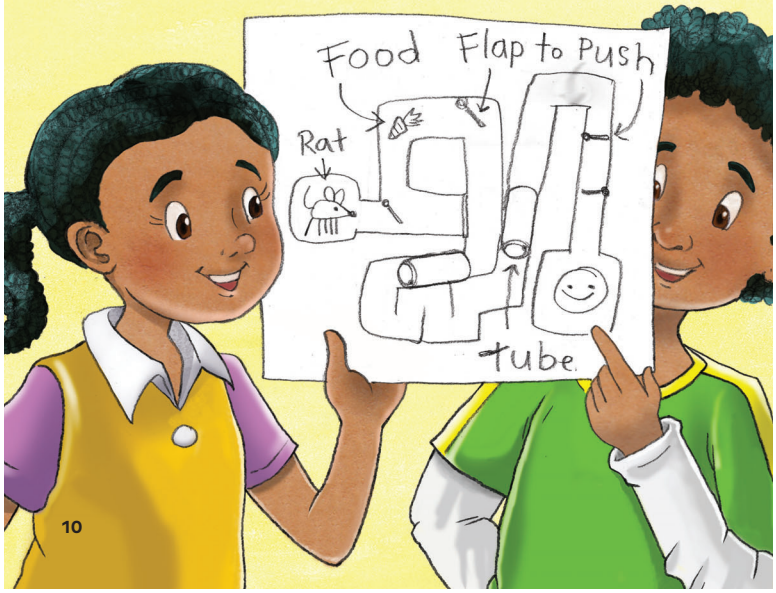
Omar had designed a track for a ball. He thought Ratty could push the ball along the track. Omar showed everyone his drawing.

Kai shared her drawing next. She wanted to put vegetables into a ball with holes in it. Ratty liked to eat vegetables. Kai thought Ratty could pull the vegetables out of the holes.

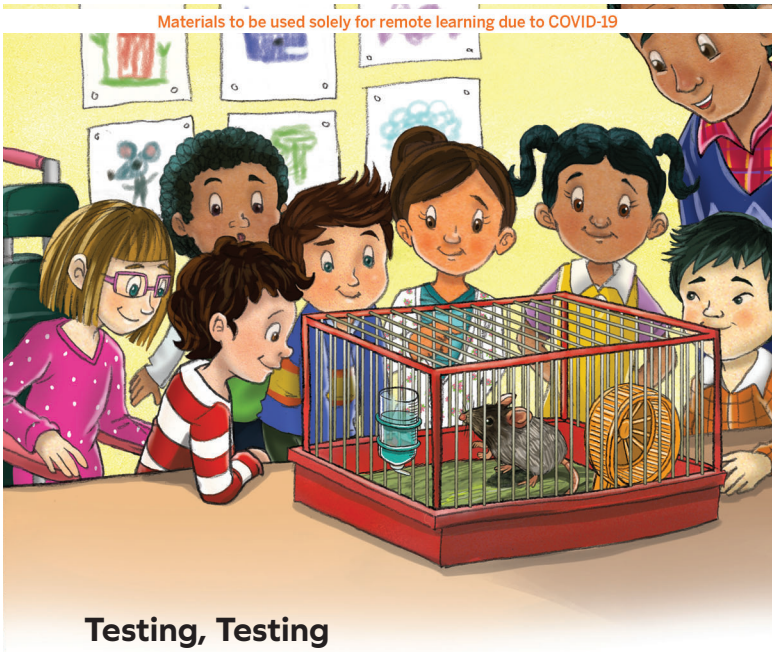
Materials to be used solely for remote learning due to COVID-19

Leo and Jayden wanted to make a cardboard maze for Ratty to explore. They thought Ratty could push open cardboard flaps to get through the maze. The two of them had worked on a drawing together after school.

"What wonderful solutions!" said Mr. S.



Materials to be used solely for remote learning due to COVID-19



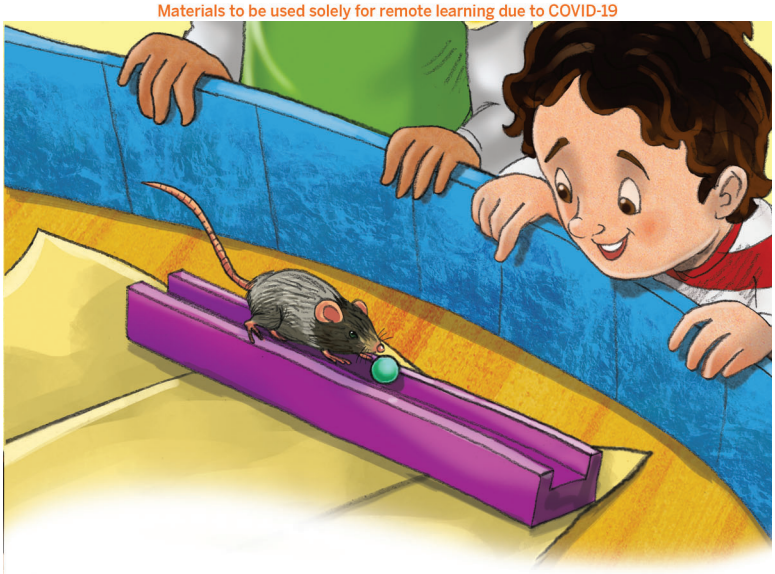
Testing, Testing

Room 4 was busy that week. On Monday, Mr. S said, "You designed some ways for Ratty to exercise. Let's **test** your solutions to see how well they will work."

Mr. S explained that testing might give them new ideas and help them think of ways to make their solutions even better.

Materials to be used solely for remote learning due to COVID-19

On Tuesday, the class tested Omar's track idea. They put Ratty on the track and gave him a big ball to push. The first time they tried it, the ball fell off the track. The ball fell off again the second time they tried it.



They were about to test a third time, but Omar said, "Wait! Let's try a smaller ball. It will stay inside the edges of the track. It won't fall off like the big ball."

The class talked together, and decided that trying a smaller ball was a good idea. They tested the track with the smaller ball. This time, the ball stayed in the track. Ratty pushed it from one end to the other!

On Wednesday, the class tested Kai's idea about filling a ball with vegetables. They used a plastic ball from the recess supplies. It had round holes in it.

Ratty's favorite vegetable was peas, so they put lots of peas into the ball. The peas were small and round, so they were easy to put into the round holes.

The kids tied the ball on a string. They hung it in Ratty's cage.

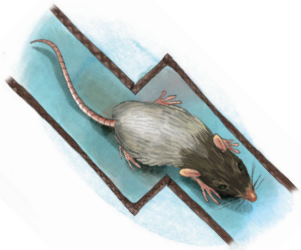
Ratty gave the ball a little push, and all the peas fell out. He ate them off the floor of his cage.

"That was too easy," said Kai. "The peas just fell out. Ratty didn't have to pull them."

Kai told the class she thought the vegetables in the ball should be a different shape. Instead of small and round, they should be long and thin. The class put string beans into the ball. They had to push the string beans into the holes carefully.

They gave the ball with string beans to Ratty. Ratty grabbed a string bean in his teeth and started pulling. He pulled string beans out of the ball for the rest of the day.

On Thursday, the class built Leo and Jayden's maze. Everybody added pieces to the maze. They used cardboard boxes, toilet paper tubes, and other pieces of cardboard they could find. In parts of the maze, the kids made flaps for Ratty to push. There were also tunnels to crawl through, ramps to climb, and even a slide!



The kids put the maze on the floor of the classroom and put Ratty inside.

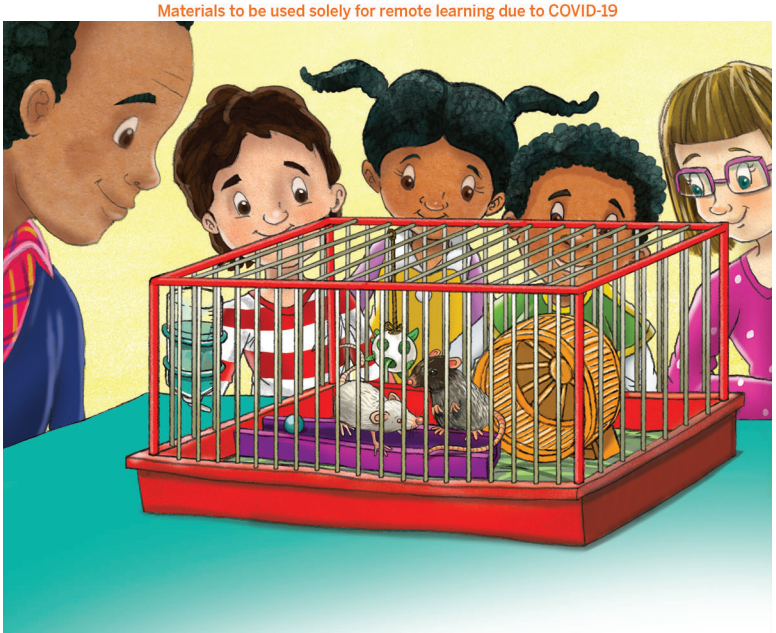
Ratty explored the maze for a long time. He pushed through the flaps and climbed on everything. Leo put Ratty at the top of the slide, and he slid down. It seemed like Ratty was getting lots of exercise in the maze.

Lots of Solutions

On Friday, the class put all their solutions together. Inside Ratty's cage, they put Kai's ball of vegetables and Omar's track for pushing a ball.

The cardboard maze was too big to fit in Ratty's cage, but the class decided to keep it in the closet. Mr. S said they could bring out the maze for Ratty to play in at least once a week.

"Nice work, class!" said Mr. S. "You solved Ratty's exercise problem."



Mr. S had a surprise for the class: another rat to live in the classroom! Mr. S put the new rat in the cage with Ratty. The two rats sniffed each other.

The kids had lots of questions. "What should we name Ratty's friend?" "Will they get along?" "Where will the new rat sleep?" Now the kids had a new problem to solve: finding room in Ratty's cage for the new rat.

They decided to design some changes to the rat cage. The kids got out some paper and started drawing their ideas.

Glossary

design: to try to make something new that people want or need

exercise: to play sports or move around in order to stay healthy

force: a push or a pull

exert: to cause a force to act on an object

solution: something that helps people do what they want or need to do

test: to try something and find out what happens

vet: a kind of doctor who keeps animals healthy

visualize: to make a picture in your mind

Books for *Pushes and Pulls*:
Talking About Forces
Building with Forces
Room 4 Solves a Problem
A Busy Day in Pushville
Forces in Ball Games

Lawrence Hall of Science:
Program Directors: Jacqueline Barber and P. David Pearson
Curriculum Director, Grades K–1: Alison K. Billman
Curriculum Director, Grades 2–5: Jennifer Tilson

Lead Book Developers: Ashley Chase and Chloë Delafield

***Pushes and Pulls* Book Development Team:**
Joan Carey, Kate Donaldson-Fletcher, Andrew Falk, Sophia Lambertsen, Meredith W. Moran, Elizabeth Shafer

Amplify:
Irene Chan, Samuel Crane, Shira Kronzon, Charvi Magdaong, Thomas Maher, Rick Martin, Matt Reed, Eve Silberman, Steven Zavari

Design and Production: Fran Biderman-Gross, advantages.net

Credits:
Illustrations: Jomike Tejido

Materials to be used solely for remote learning due to COVID-19

Pushes and Pulls

How can the kids in Room 4 help their pet rat?

Ratty has a problem. He needs more exercise! The kids in Room 4 have lots of ideas about how to help Ratty. They design many different solutions to Ratty's problem. The solutions all have one thing in common: they use pushes and pulls to help Ratty exercise.

THE LAWRENCE HALL OF SCIENCE
University of California, Berkeley

K

Amplify. Published and Distributed by Amplify.
www.amplify.com

ISBN 978-1-943228-62-1

Materials to be used solely for remote learning due to COVID-19

AmplifyScience

Forces in Ball Games

by Ashley Chase

Reference Book

Materials to be used solely for remote learning due to COVID-19

Forces in Ball Games

by Ashley Chase

These materials are based upon work partially supported by the National Science Foundation under grant numbers DRL-1119584, DRL-1417939, ESI-0242733, ESI-0628272, ESI-0822119. The Federal Government has certain rights in this material. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

These materials are based upon work partially supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A130610 to The Regents of the University of California. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

Developed by the Learning Design Group at the University of California, Berkeley's Lawrence Hall of Science.

Amplify Science Elementary is based on the *Seeds of Science/Roots of Reading*® approach, which is a collaboration between a science team led by Jacqueline Barber and a literacy team led by P. David Pearson.

www.scienceandliteracy.org

Amplify.
55 Washington Street, Suite 800
Brooklyn, NY 11201
1-800-823-1969
www.amplify.com

Grade K
Forces in Ball Games
ISBN: 978-1-943228-66-9

Materials to be used solely for remote learning due to COVID-19

Contents

Materials to be used solely for remote learning due to COVID-19

Introduction

People love to play ball games. A ball game is any game with a ball in it.

To play a ball game, you need to make the ball move. To make a ball move, you need to **exert** a **force** on it. Forces are pushes and pulls.

You can exert a force on a ball by hitting it, kicking it, bouncing it, throwing it, or catching it. There are lots of other ways, too.

Materials to be used solely for remote learning due to COVID-19

In many games, players need to get the ball to a goal. Soccer is a game like this. To make the ball go into the goal, you have to exert a force on the ball in the **direction** of the goal.

The goal might be nearby or very far away. You can make a ball move a long **distance** by exerting a strong force on it. You can exert a gentle force on the ball to make it move a short distance instead.

You can make a ball move fast or slow. The stronger the force you exert on the ball, the faster it will go.

This is a book about forces in ball games.

How does the ball move in baseball?

The men played baseball. This player hit the ball hard with the bat. The ball went fast. It flew far away.

The ball went a long **distance** because the bat **exerted** a strong **force** on it.

This player hit the ball gently with the bat. The ball moved slowly. It landed nearby.

The ball went a short distance because the bat exerted a gentle force on it.

How does the ball move in basketball?

The women played basketball. This player threw the ball at the basket.

The ball moved toward the basket because her hands **exerted** a **force** on the ball in the **direction** of the basket.

This player dribbled the ball. She pushed the ball down. It hit the floor and bounced back up again.

The ball changed direction after it hit the floor because the floor exerted a force on it.

How does the ball move in bowling?

The boy went bowling. He pushed the ball hard. The ball went fast. It rolled all the way to the end where the pins were.

The ball went a long **distance** because the boy's hand **exerted** a strong **force** on it.

The pins were standing in rows. The ball hit the pins, and the pins fell over. They rolled all around.

The pins started to move because the ball exerted a force on them.

How does the ball move in croquet?

The girl played croquet (kro-KAY). She wanted the ball to go to the striped stick. The stick was not far away. She hit the ball gently with the mallet. It rolled slowly to the stick.

The ball went a short **distance** because the mallet **exerted** a gentle **force** on it.

The ball rolled to the striped stick. It hit the stick and bounced back a little.

The ball changed **direction** when it hit the stick because the stick exerted a force on the ball.

How does the ball move in foosball?

The teenagers played foosball. They used rods to push and pull the foosball men.

The foosball men moved because the rods **exerted forces** on them.

The ball was rolling across the table. The foosball man bumped into the ball. The ball started rolling the other way.

The ball changed **direction** because the foosball man exerted a force on it.

How does the ball move in football?

The men played football. The player in blue threw the ball hard. The ball flew through the air. It went fast and far.

The ball went a long **distance** because the player's hand **exerted** a strong **force** on it.

The player in white ran across the field toward the goal. Then the player in yellow grabbed him. Instead of moving toward the goal, the player in white started falling toward the ground.

The player in white changed **direction** because the player in yellow exerted a force on him.

How does the ball move in foursquare?

The kids played foursquare. The boy hit the ball to the right, into the next square.

The ball moved to the right because the boy's hand **exerted** a **force** to the right.

The girl hit the ball to the left, into another square.

The ball moved to the left because the girl's hand exerted a force to the left.

How does the ball move in golf?

The people played golf. This player wanted the ball to go far. He hit the ball hard with the golf club. The ball flew across the grass. It went fast and far.

The ball went a long **distance** because the club **exerted** a strong **force** on it.

This player wanted the ball to go just far enough to fall into the hole. She knew the ball would go too far if she hit it too hard. She hit the ball gently with the golf club. The ball rolled slowly to the hole and fell in.

The ball went a short distance because the club exerted a gentle force on it.

How does the ball move in kickball?

The families played kickball. This girl kicked the ball and it flew into the air.

The ball went up because her foot **exerted** an upward **force** on the ball.

The ball hit the ground and bounced.

The ball changed **direction** when it hit the ground because the ground exerted a force on the ball.

How does the ball move in lacrosse?

The women played lacrosse. This player wanted to get the ball into the goal. She threw the ball with the stick.

The ball went toward the goal because the stick **exerted** a **force** on the ball in that **direction**.

The ball was moving toward this player. She used her stick to catch it.

The ball stopped moving because the stick exerted a force on it.

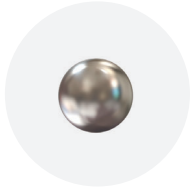
How does the ball move in mini-golf?

The kids played mini-golf. The girl wanted the ball to go into the hole. She hit the ball gently with her golf club and it rolled slowly toward the hole.

The ball moved a short **distance** because the club **exerted** a gentle **force** on it.

The boy reached into the hole and pulled the ball out.

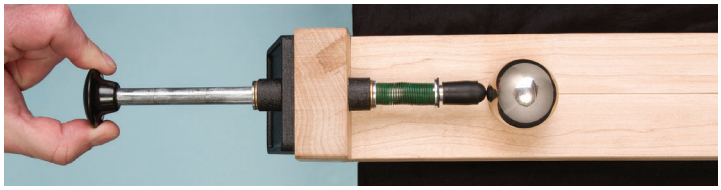
The ball moved up out of the hole because the boy's hand exerted an upward force on it.



How does the ball move in pinball?

I played pinball. I pulled the launcher back and let go. The launcher hit the ball and it rolled away.

The ball started to move because the launcher **exerted** a **force** on the ball.



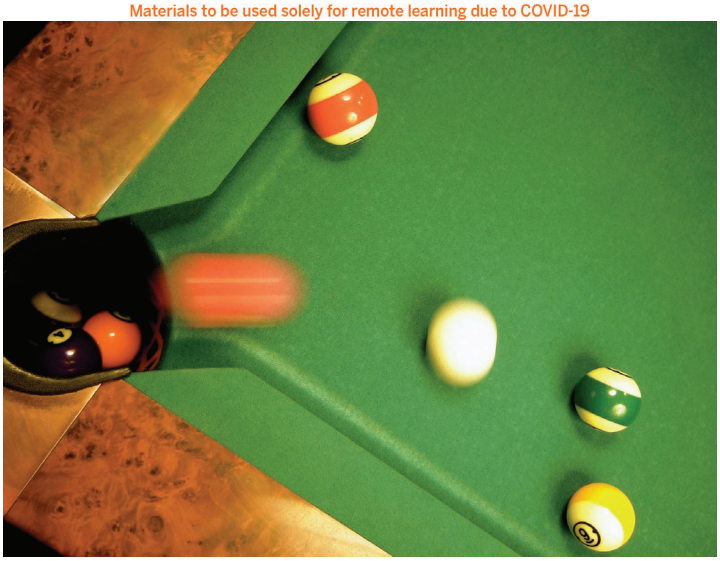
The ball was rolling toward me. I hit the ball with the flipper. The ball started rolling the other way.

The ball changed **direction** because the flipper exerted a force on the ball.

How does the ball move in pool?

The man played pool. He poked the white ball with the stick.

The ball started moving because the stick **exerted** a **force** on it.



The white ball rolled and hit the red ball. Then the red ball rolled toward the hole.

The red ball went in the hole because the white ball exerted a force on it in that **direction**.

How does the ball move in soccer?

The girls played soccer. This girl kicked the ball at the goal.

The ball went toward the goal because her foot **exerted** a **force** on it in that **direction**.

The ball was rolling toward the goal. The goalie stopped the ball and kept it from going into the goal.

The ball stopped moving because the goalie's hands exerted a force on it.

How does the ball move in street hockey?

The kids played street hockey. One kid hit the ball with the stick. He hit the ball at the goal.

The ball rolled toward the goal because the stick **exerted** a **force** on it in that **direction**.

The goalie stopped the ball with his pads.

The ball stopped moving because the pads exerted a force on it.

How does the ball move in table tennis?

The teenagers played table tennis. The boy hit the ball with his paddle. It flew across the table.

The ball flew across the table because the paddle **exerted** a **force** on it in that **direction**.

The ball flew across the table toward the girl. The girl hit the ball with her paddle. The ball started flying the other way, back across the table.

The ball changed direction because the paddle exerted a force on it.

How does the ball move in T-ball?

The boys played T-ball. The ball was sitting on the T. The boy hit the ball with the bat. The ball started moving.

The ball started moving because the bat **exerted** a **force** on the ball.

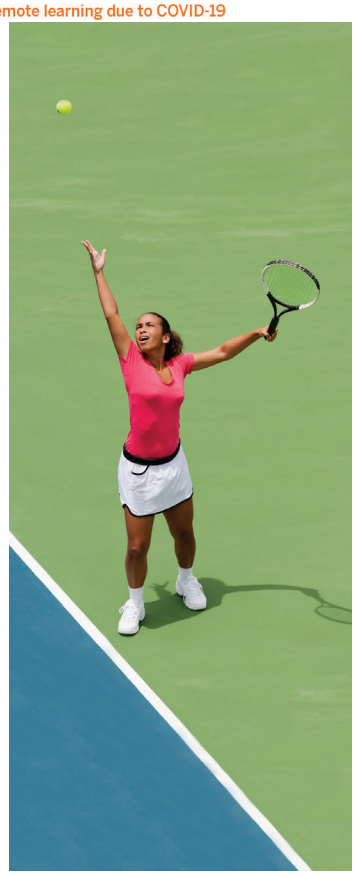
The ball was flying through the air. The boy caught it with his mitt.

The ball stopped moving because the mitt exerted a force on it.

How does the ball move in tennis?

The women played tennis. This player threw the ball up into the air.

The ball went up because her hand **exerted** an upward **force** on the ball.



The ball was flying toward this player. She hit it with her racket. The ball started moving away from her.

The ball changed **direction** because the racket exerted a force on it.

How does the ball move in tetherball?

The kids played tetherball. The girl hit the ball with her hands. The ball moved away from her.

The ball moved away because her hands **exerted** a **force** in that **direction**.

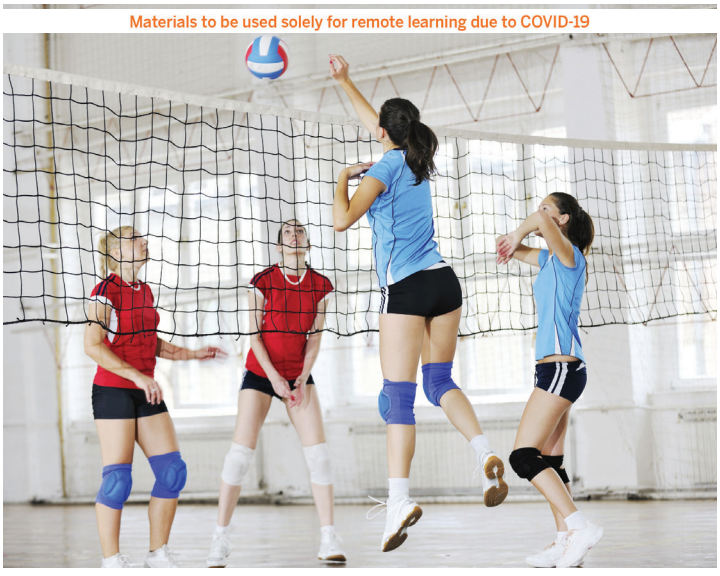
The ball was tied to a rope. The rope was twisting around a pole. The rope pulled the ball closer and closer to the pole.

The ball moved closer to the pole because the rope exerted a force in that direction.

How does the ball move in volleyball?

The women played volleyball. The player in red hit the ball with her hand. She pushed it to the other side of the net.

The ball moved to the other side of the net because her hand **exerted** a **force** in that **direction**.



The ball was flying over the net. The player in blue hit the ball back to the other side.

The ball changed direction because her hand exerted a force on the ball.

How do balls move in other ball games?

There are so many ball games! What are some **forces** in your favorite ball game?

Glossary

direction: the way something is facing or moving, such as left, right, toward you, or away from you

distance: how far it is between two things

exert: to cause a force to act on an object

force: a push or a pull

Index

Books for *Pushes and Pulls*:

Talking About Forces
Building with Forces
Room 4 Solves a Problem
A Busy Day in Pushville
Forces in Ball Games

Lawrence Hall of Science:
Program Directors: Jacqueline Barber and P. David Pearson
Curriculum Director, Grades K–1: Alison K. Billman
Curriculum Director, Grades 2–5: Jennifer Tilson

Lead Book Developers: Ashley Chase and Chloë Delafield

***Pushes and Pulls* Book Development Team:**

Joan Carey	Andrew Falk	Meredith W. Moran
Kate Donaldson-Fletcher	Sophia Lambertsen	Elizabeth Shafer

Amplify:

Irene Chan	Charvi Magdaong	Matt Reed
Samuel Crane	Thomas Maher	Eve Silberman
Shira Kronzon	Rick Martin	Steven Zavari

Design and Production: Fran Biderman-Gross, advantages.net

Credits:
Photographs: Cover, Pages 1, 4–17, 18 (b), 20–21, 22 (b), 24–25, 26 (bl), 27, 28 (tl), 29, 30 (b), 32–33, 34 (b), 36–39, 40 (tl), 42 (bl), 44–45, 46 (tl, r), 47: Shutterstock; Pages 18 (t), 19: Steve Dykes/Stringer/Getty Images Sport; Pages 22 (t), 23: Yellow Dog Productions/The Image Bank/Getty Images; Page 26 (t): Kracoswar/E+/Getty Images; Page 28: (tr) G. Cigolini/De Agostini Picture Library/Getty Images, (b) Edward Kinsman/Science Source/Getty Images; Page 30 (t): Chris Sattleberger/Culture/Getty Images; Page 31: Medioimages/Photodisc/Getty Images; Page 34 (t): Boston Globe/Getty Images; Page 35: Elsa/Getty Images Sport; Page 40 (r): Bob Thomas/E+/Getty Images; Page 41: Michael Krinke/E+/Getty Images; Page 42 (t): Catherine Ledner/Stockbyte/Getty Images; Page 43: Charlie Shuck/Stockbyte/Getty Images; Page 46 (bl): Marni Gibbs/Moment/Getty Images

Pushes and Pulls

How do you use forces when you play games?

People all over the world play ball games. In a ball game, players exert forces to make things happen. Learn about many different kinds of ball games and the forces that make them possible.

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

K

Amplify. Published and Distributed by Amplify.
www.amplify.com

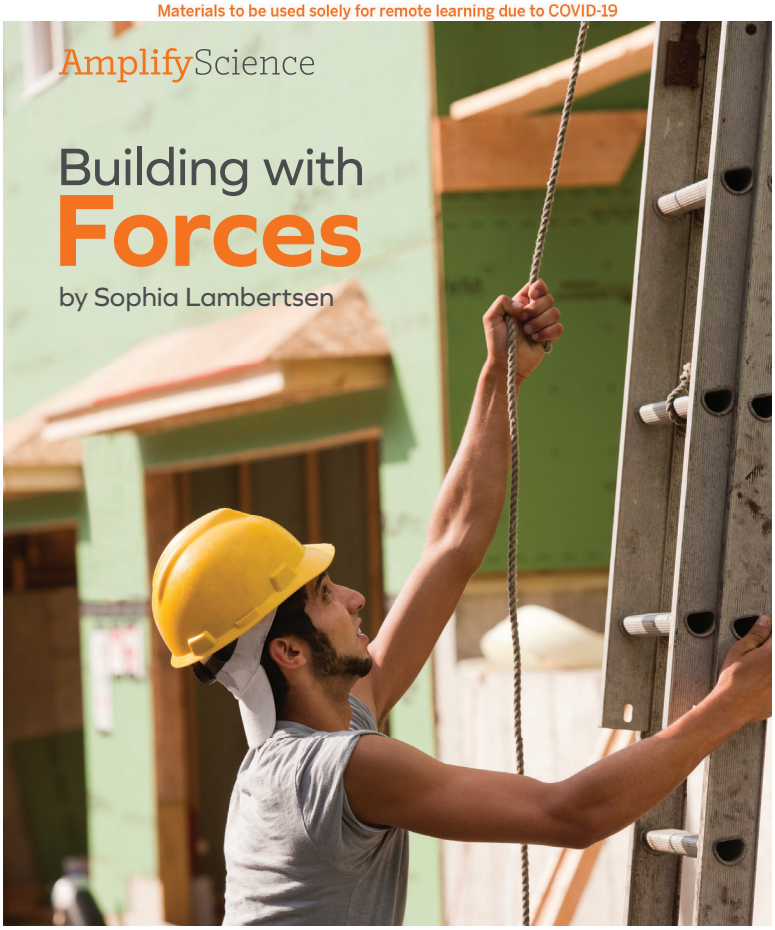
ISBN 978-1-943228-66-9

Materials to be used solely for remote learning due to COVID-19

AmplifyScience

Building with Forces

by Sophia Lambertsen



Materials to be used solely for remote learning due to COVID-19

Building with Forces

by Sophia Lambertsen

Materials to be used solely for remote learning due to COVID-19

These materials are based upon work partially supported by the National Science Foundation under grant numbers DRL-1119584, DRL-1417939, ESI-0242733, ESI-0628272, ESI-0822119. The Federal Government has certain rights in this material. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

These materials are based upon work partially supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A130610 to The Regents of the University of California. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Developed by the Learning Design Group at the University of California, Berkeley's Lawrence Hall of Science.

Amplify Science Elementary is based on the *Seeds of Science/Roots of Reading*® approach, which is a collaboration between a science team led by Jacqueline Barber and a literacy team led by P. David Pearson.

www.scienceandliteracy.org

Amplify.
55 Washington Street, Suite 800
Brooklyn, NY 11201
1-800-823-1969
www.amplify.com

Grade K
Building with Forces
ISBN: 978-1-943228-68-3

Men and women work hard to build things at construction sites.

When a construction worker is building something, every brick, nail, and piece of wood has a place where it needs to go. Workers **exert forces** to put things where they belong.

3

Garrett and Theo work together to build a roof. Garrett pushes a piece of wood up next to the other pieces of wood. He is exerting a force in the **direction** of the roof.

4

Garrett cannot just stand there and hold the wood all day. He uses a metal pole to keep exerting a force on the piece of wood. The pole pushes the wood in the direction of the roof and keeps the wood in place. Now Garrett can keep working!

5

Theo uses bricks and cement to build a wall for the outside of the building. He exerts forces in two directions. He exerts a force to the left and then he exerts a force to the right. He is wiggling the brick from one direction to the other. He is making sure it fits on top of the other bricks.

6

Theo makes sure all his bricks are stuck to the cement. He pounds them into place by pushing down with his hand. He needs to make sure all the bricks are in just the right places or the wall will not stay up.

7

May, Liz, and Jane are helping to build a house. They are putting up a frame for the wall. They all exert a force in the same direction so the frame will stand up just where it needs to go.

8

Fran and Lee are working on the other side of the frame. Fran helps to hold up the frame by exerting a force toward her body. Lee hammers a nail in to keep the wood in place. The hammer exerts a force toward the wood and pushes the nail into the wood.

9

Annie and Jo are working on another part of the house. They exert a force up and away from their bodies to lift this frame.

10

Now Annie measures the frame and marks where a nail will go. She exerts a force to the left to stretch out the measuring tape.

Sometimes a construction job is too big for a person to do. Austin and Michael are building a big store, but there is a lot of sand in the way. They need to use a machine to help them.

The machine exerts a strong force up and pushes the sand up onto the top of the pile. The sand lands in the truck, right where it belongs.

Michael and Austin shake hands at the end of the day. Michael exerts a force up and down. Which way does his hand go?

At the construction site, everyone works hard. They need to exert forces in the right direction, so everything ends up where it belongs.

Are people and machines in these pictures exerting forces in different directions?

Glossary

direction: the way something is facing or moving, such as left, right, toward you, or away from you

exert: to cause a force to act on an object

force: a push or a pull

Books for *Pushes and Pulls*:

Talking About Forces
Building with Forces
Room 4 Solves a Problem
A Busy Day in Pushville
Forces in Ball Games

Lawrence Hall of Science:
Program Directors: Jacqueline Barber and P. David Pearson
Curriculum Director, Grades K–1: Alison K. Billman
Curriculum Director, Grades 2–5: Jennifer Tilson

Lead Book Developers: Ashley Chase and Chloë Delafield

***Pushes and Pulls* Book Development Team:**
Joan Carey, Kate Donaldson-Fletcher, Andrew Falk, Sophia Lambertsen, Meredith W. Moran, Elizabeth Shafer

Amplify:
Irene Chan, Samuel Crane, Shira Kronzon, Charvi Magdaong, Thomas Maher, Rick Martin, Matt Reed, Eve Silberman, Steven Zavari

Design and Production: Fran Biderman-Gross, advantages.net

Credits:
Photographs: Cover, Pages 1, 3 (l): Huntstock/Brand X Pictures/Getty Images; Pages 3 (tr), 4–7: Shutterstock; Page 3 (mr): Martin Barraud/Caiaimage/Getty Images; Page 3 (br): Maskot/Getty Images; Pages 8–9: Ariel Skelley/Blend Images/Getty Images; Pages 10–11: Hero Images/Getty Images; Pages 12, 14, 15 (ml): Huntstock/Getty Images; Page 13: ewg3D/E+/Getty Images; Page 15: (tl) ViewStock/Getty Images, (bl) Sam Edwards/Caiaimages/Getty Images, (r) Rainer Elstermann/DigitalVision/Getty Images

Pushes and Pulls

At the construction site, people exert forces in different directions.

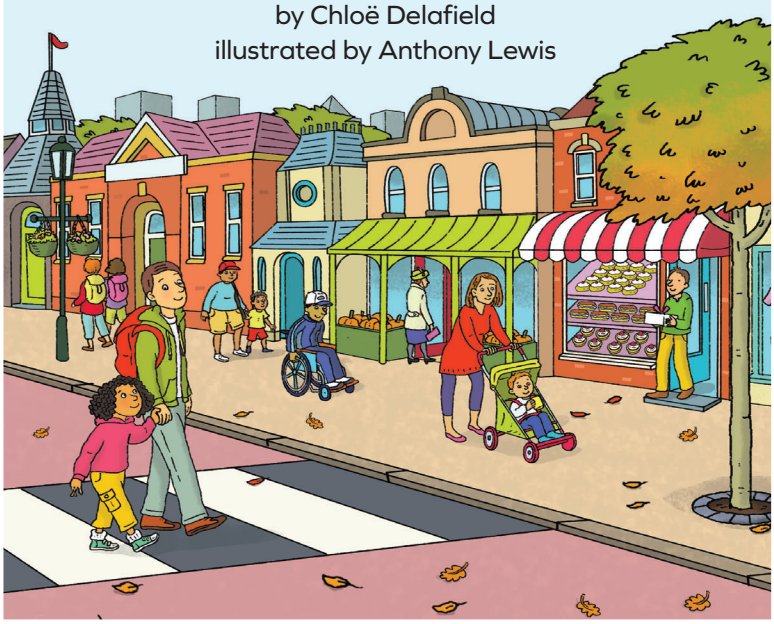
When people build houses and other buildings, they push and pull things to get them in the right places. See how construction workers exert forces to put up walls and roofs.

THE LAWRENCE HALL OF SCIENCE
K
Amplify.
Published and Distributed by Amplify.
www.amplify.com
ISBN 978-1-943228-68-3

AmplifyScience

A Busy Day in PUSHVILLE

by Chloë Delafield
illustrated by Anthony Lewis



A Busy Day in Pushville

by Chloë Delafield
illustrated by Anthony Lewis

These materials are based upon work partially supported by the National Science Foundation under grant numbers DRL-1119584, DRL-1417939, ESI-0242733, ESI-0628272, ESI-0822119. The Federal Government has certain rights in this material. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

These materials are based upon work partially supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A130610 to The Regents of the University of California. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

Developed by the Learning Design Group at the University of California, Berkeley's Lawrence Hall of Science.

Amplify Science Elementary is based on the *Seeds of Science/Roots of Reading*® approach, which is a collaboration between a science team led by Jacqueline Barber and a literacy team led by P. David Pearson.

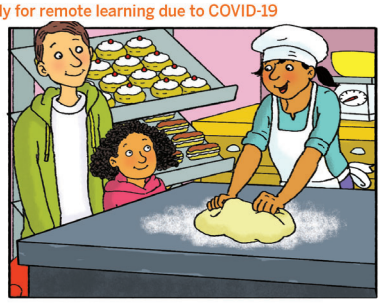
www.scienceandliteracy.org

Amplify.
55 Washington Street, Suite 800
Brooklyn, NY 11201
1-800-823-1969
www.amplify.com

Grade K
A Busy Day in Pushville
ISBN: 978-1-943228-60-7

I live in a town called Pushville. People do all kinds of different jobs in my town. On the way to the library with my dad, I see lots of people doing their jobs. They all use **forces** to do their jobs!
I just learned about forces at school, and now I see people using forces everywhere. They use pushes and pulls to make things move and change. Pushes and pulls are forces.

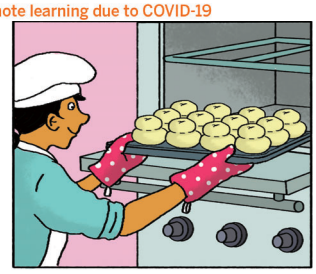
The **baker kneads** bread **dough**.

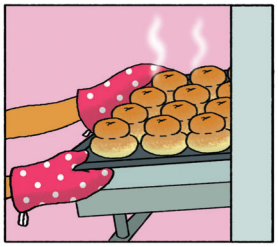


She pushes the dough against the counter. Bam! Bam! Bam!

She pulls the dough until it is looooooong. Strrrrretch.

When the dough is ready, she pushes the pan into the oven so it can bake.



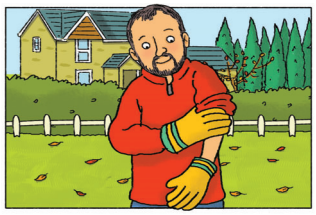


She will pull the pan out of the oven when it is just right. Yum!

The firefighter pulls the hose out of the fire truck. He pulls and pulls to unroll the hose. It is very long.

The hose has to reach all the way from the truck to the tree so the firefighter can put out the fire. He pulls it across the lawn and up to the tree. Splash! He puts out the fire.

The **gardener** pulls on his gardening gloves. He pushes up his sleeves and gets a **rake**.



Then he pulls the rake to drag leaves across the lawn.

He pulls the rake again and again to bring all the leaves into a big pile. Then the pile is ready for kids to jump into!

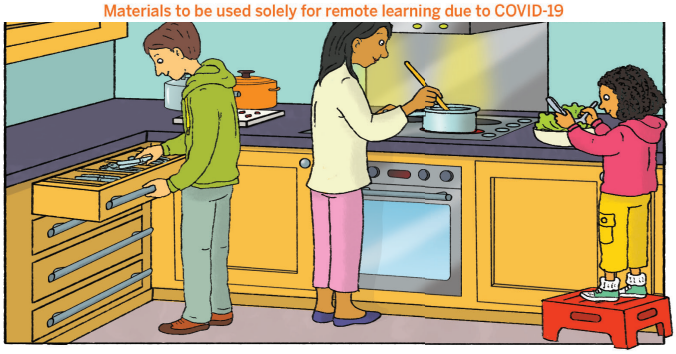
I push open the door to the library and walk inside. We are just in time to hear a story! The **librarian** pulls a book off the shelf. He reads the book to us. Then he pushes it across the table so we can look at the pictures.

I am going to check out a book so I can read it at home. I pull it close as I carry it home. I will read it with my mom at bedtime!

When we get back home, my dad and I sit and make pictures together. I push a paintbrush across the paper. I painted a river!

My dad is drawing with pencils. He pulls the pencil down the page to make a line. What is he drawing?

When my mom gets home from work, we all go to the grocery store together to get some food for dinner. We push the grocery cart around the store. Dad pulls a box off the shelf and puts it in the cart.



At home, we cook dinner together. Dad pulls open a drawer to get forks for us. It is time to eat. We all pull our chairs in to the table. What a great day! I can find forces everywhere.

Glossary

baker: a person who makes things in an oven, like bread and cakes

dough: a mixture of flour, water, and other things that turns into bread when it is baked

force: a push or a pull

gardener: a person who takes care of plants

knead: to push and pull dough before baking it

librarian: a person who helps people find books at the library

rake: a tool used for moving leaves and branches

Materials to be used solely for remote learning due to COVID-19

Books for *Pushes and Pulls*:

Talking About Forces
Building with Forces
Room 4 Solves a Problem
A Busy Day in Pushville
Forces in Ball Games

Lawrence Hall of Science:
Program Directors: Jacqueline Barber and P. David Pearson
Curriculum Director, Grades K–1: Alison K. Billman
Curriculum Director, Grades 2–5: Jennifer Tilson

Lead Book Developers: Ashley Chase and Chloë Delafield

***Pushes and Pulls* Book Development Team:**
Joan Carey, Kate Donaldson-Fletcher, Andrew Falk, Sophia Lambertsen, Meredith W. Moran, Elizabeth Shafer

Amplify:
Irene Chan, Samuel Crane, Shira Kronzon, Charvi Magdaong, Thomas Maher, Rick Martin, Matt Reed, Eve Silberman, Steven Zavari

Design and Production: Fran Biderman-Gross, advantages.net

Credits:
Illustrations: Anthony Lewis

Materials to be used solely for remote learning due to COVID-19

Pushes and Pulls

People use forces to do their jobs all around town.

A girl and her dad take a walk around town. They meet a baker, a gardener, a librarian, and other people who use pushes and pulls while they are working. People are using forces everywhere!

THE LAWRENCE HALL OF SCIENCE
K
Amplify.

Published and Distributed by Amplify.
www.amplify.com

ISBN 978-1-943228-60-7

Math

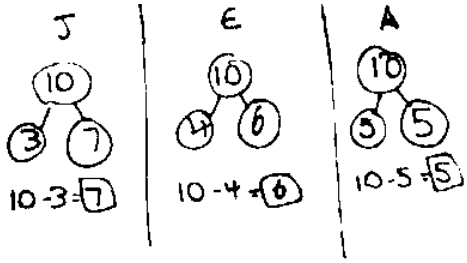
Topic A: Counting On or Making Ten to Solve Result Unknown and Total Unknown Problems

To introduce students to the make ten strategy, in Topic A students solve problems with three addends and realize it is sometimes possible to use the associative and commutative properties to compose ten.

LESSON 1

Word Problem (5 min)

John, Emma, and Alice each had 10 raisins. John ate 3 raisins, Emma ate 4 raisins, and Alice ate 5 raisins. How many raisins do they each have now? Write a number bond and a number sentence for each.



Note: This problem was chosen as an application of the culminating subtraction work from Mission 1. All three subtraction sentences and number bonds focus on partners to ten, which are foundational to the first lesson of Mission 2.

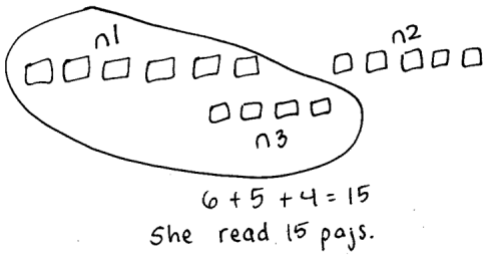
LESSON 2

Word Problem (5 min)

Lisa was reading a book. She read 6 pages the first night, 5 pages the next night, and 4 pages the following night. How many pages did she read?

Make a drawing to show your thinking. Write a statement to go with your work.

Extension: If she read a total of 20 pages by the fifth night, how many pages could she have read on the fourth night and the fifth night?

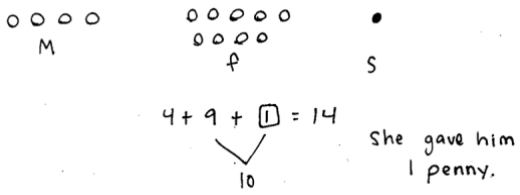


Note: This problem applies the Small Group Lesson 1 objective of adding three addends, two of which make ten. The two addends that make ten are separated within the story.

LESSON 3

Word Problem (5 min)

Tom's mother gave him 4 pennies. His father gave him 9 pennies. His sister gave him enough pennies so that he now has a total of 14. How many pennies did his sister give him? Use a drawing, a number sentence, and a statement.



Extension: How many more would he need to have 19 pennies?

Note: This Word Problem challenges students to consider finding an unknown addend within a context with three addends. Students may add 4 and 9 together first, noticing that they need 1 more penny to make 14. Other students may recognize that 14 is made of 10 and 4 and realize that they are looking for the partner for 9 when making ten.

LESSON 4

Word Problem (5 min)

Michael plants 9 flowers in the morning. He then plants 4 flowers in the afternoon. How many flowers did he plant by the end of the day? Make a drawing, a number bond, and a statement.

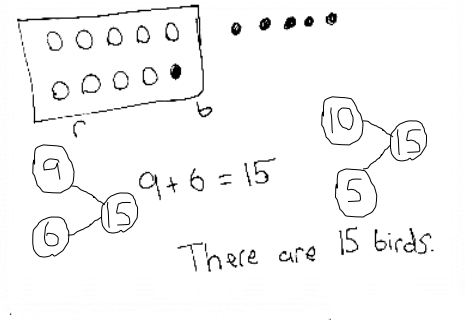
Note: Students can apply the make ten strategy from Small Group Lesson 3 as they solve this problem.

LESSON 5

Word Problem (5 min)

There are 9 red birds and 6 blue birds in a tree. How many birds are in the tree? Use a ten-frame drawing and a number sentence. Write a number bond to match the story and a number bond to show the matching 10+ fact. Write a statement.

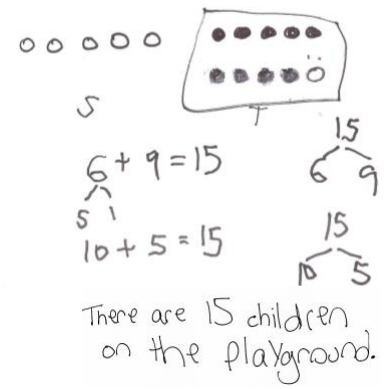
Note: This problem continues to provide contextual practice of solving addition situations where one addend is 9. By drawing a number bond to match the story and drawing a number bond to match the ten-frame drawing, students continue to relate the addition facts of 9 with the addition facts of 10.



LESSON 6

Word Problem (5 min)

There are 6 children on the swings and 9 children playing tag. How many children are playing on the playground? Make ten to solve. Create a drawing, a number bond, and a number sentence along with your statement.

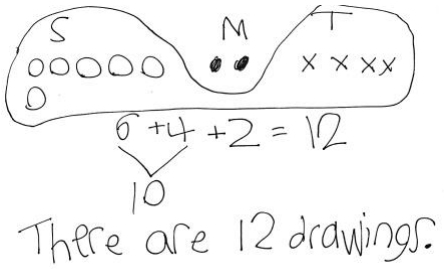


Note: This problem gives students the chance to apply learning from Small Group Lessons 3, 4, and 5 as they solve problems with 9 as an addend.

LESSON 7

Word Problem (7 min)

Stacy made 6 drawings. Matthew made 2 drawings. Tim made 4 drawings. How many drawings did they make altogether? Use a drawing, a number sentence, and a statement to match the story.



Note: Some students may actually create detailed drawings. Continue discussing how simple shapes, such as squares or circles, can be used to efficiently represent the story's drawings rather than spending time and thought on elaborate pictures.

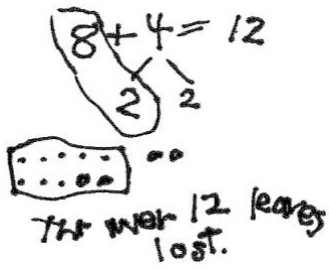
LESSON 8

Word Problem (5 min)

A tree lost 8 leaves one day and 4 leaves the next. How many leaves did the tree lose at the end of the two days? Use a number bond, a number sentence, and a statement to match the story.

Extension: On the third day, the tree lost 6 leaves. How many leaves did it lose by the end of the third day?

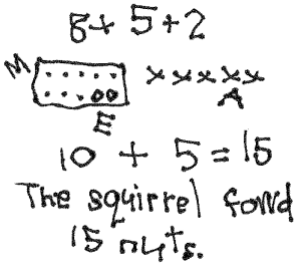
Note: This problem revisits the idea of making ten when one addend is 8. It also challenges students to use addition, although the leaves are being lost.



LESSON 9

Word Problem (8 min)

A squirrel found 8 nuts in the morning, 5 nuts in the afternoon, and 2 nuts in the evening. How many nuts did the squirrel find in all?



Extension: The next day, the squirrel found 3 more nuts in the morning, 1 more in the afternoon, and 1 more in the evening. How many did he collect over the two days?

Note: This problem uses three addends, revisiting the associative and commutative properties from earlier in this topic. Students who used making ten as a strategy to solve could share their work, supporting students' development toward independent use of the strategy.

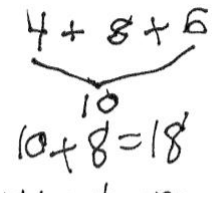
LESSON 10

Word Problem (6 min)

There were 4 boots by the classroom door, 8 boots in the hallway, and 6 boots by the teacher's desk. How many boots were there altogether?

Extension: How many pairs of boots were there in all?

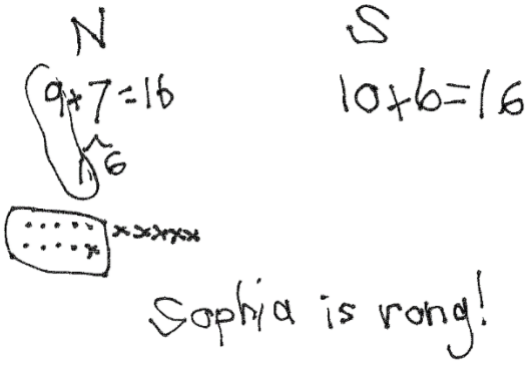
Note: In this problem, the numbers 4, 8, and 6 are used as addends. To solve, students may choose to make ten by adding (4 + 6) + 8, or they may choose to decompose either the 4 or 6 to make ten with 8.



LESSON 11

Word Problem (6 min)

Nicholas bought 9 green apples and 7 red apples. Sofia bought 10 red apples and 6 green apples. Sofia thinks she has more apples than Nicholas. Is she right? Choose a strategy you have learned to show your work. Then, write number sentences to show how many apples Nicholas and Sofia each have.

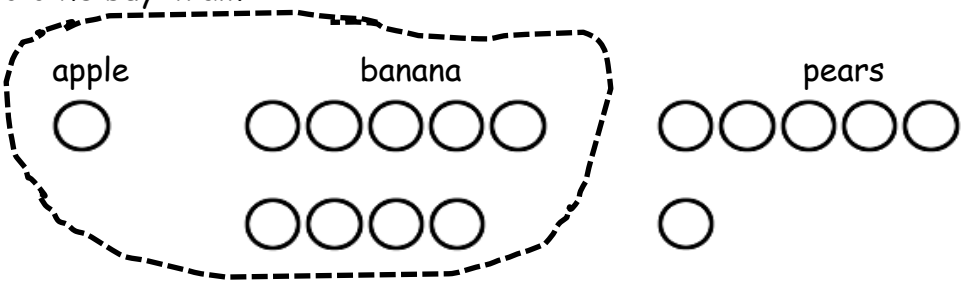


Note: This problem allows students to revisit equivalent expressions as they work with 9 + 7 and 10 + 6. The teacher can extend this thinking by either showing 9 + 7 = 10 + 6 or having students write the true number sentence themselves and then asking students to explain how they know.

Name _____ Date _____

Read the math story. Make a simple math drawing with labels. Circle 10 and solve.

1. Bill went to the store. He bought 1 apple, 9 bananas, and 6 pears. How many pieces of fruit did he buy in all?



10

1 + 9 + 6 = ____

10 + ____ = ____

Bill bought ____ pieces of fruit.

2. Maria gets some new toys for her birthday. She gets 4 dolls, 7 balls, and 3 games. How many toys did she receive?

____ + ____ + ____ = ____

10 + ____ = ____

Maria received ____ toys.

3. Maddy goes to the pond and catches 8 bugs, 3 frogs, and 2 tadpoles. How many animals did she catch altogether?

____ + ____ + ____ = ____

10 + ____ = ____

Maddy caught ____ animals.

---

4. Molly arrived at the party first with 4 red balloons. Kenny came next with 2 green balloons. Dara came last with 6 blue balloons. How many balloons did these friends bring?

____ + ____ + ____ = ____

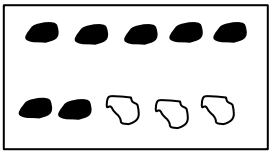
10 + ____ = ____

There are ____ balloons.

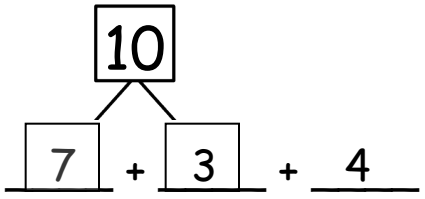
Name _____ Date _____

Circle the numbers that make ten. Draw a picture. Complete the number sentence.

1. 7 + 3 + 4 = ☐



x x x x



10 + ____ = ____

---

2. 9 + 1 + 4 = ☐

____ + ____ + ____

10 + ____ = ____

---

3. 5 + 6 + 5 = ☐

____ + ____ + ____

10 + ____ = ____

4. 4 + 3 + 7 = ☐

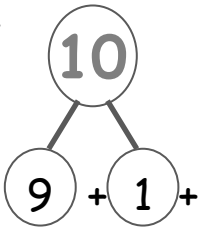
_____ + _____ + _____ 10 + _____ = _____

5. 2 + 7 + 8 = ☐

_____ + _____ + _____ 10 + _____ = _____

Circle the numbers that make ten. Put them into a number bond, and solve.

6.



+ 5 = _____

7. 8 + 2 + 4 = _____

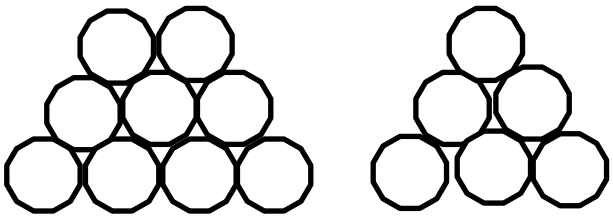
8. 3 + 5 + 5 = _____

9. 3 + 6 + 7 = _____

Name _____ Date _____

Draw and circle to show how you made ten to help you solve the problem.

1. Maria has 9 snowballs, and Tony has 6. How many snowballs do they have in all?



Maria Tony

9 and _____ make _____.

10 and _____ make _____.

Maria and Tony have _____ snowballs in all.

2. Bob has 9 raisins, and Jonny has 4. How many raisins do they have altogether?

9 + ____ = ____

10 + ____ = ____

Bob and Jonny have _____ raisins altogether.

3. There are 3 chairs on the left side of the classroom and 9 on the right side. How many total chairs are in the classroom?

9 + ____ = ____

10 + ____ = ____

There are _____ total chairs.

4. There are 7 children sitting on the rug and 9 children standing. How many children are there in all?

9 + ____ = ____

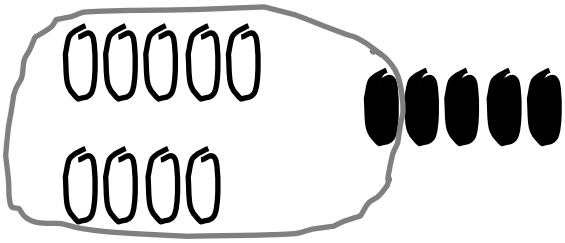
10 + ____ = ____

There are _____ children in all.

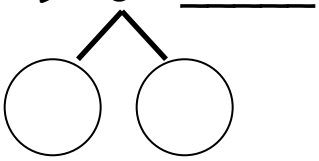
Name _____ Date _____

Change the picture to make ten. Write the easier number sentence and solve.

1. Tom has 9 red pencils and 5 yellow. How many pencils does Tom have in all?



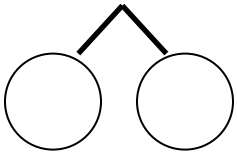
9 + 5 = _____

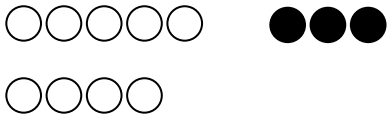


10 pencils + _____ pencils = _____ pencils

Circle 10 and solve.

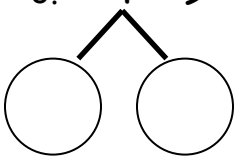
2. 9 + 3

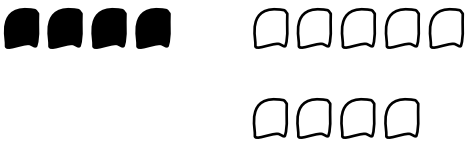




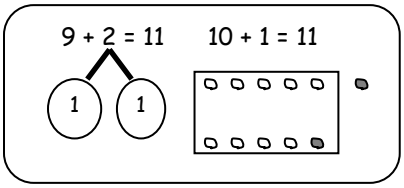
10 + _____ = _____

3. 4 + 9



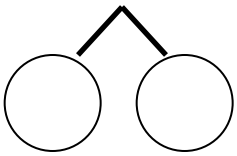


10 + _____ = _____

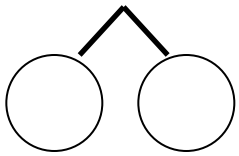


Solve. Make math drawings using the ten-frame to show how you made 10 to solve.

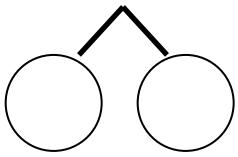
4. 9 + 5 = ____ _____ + _____ = _____



5. 6 + 9 = ____ _____ + _____ = _____



6. 8 + 9 = ____ _____ + _____ = _____



Solve. Use a number bond to show how you made ten.

7. 5 + 9 = _____

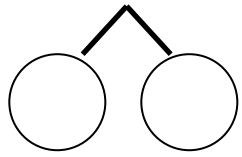
8. _____ = 9 + 7

Name _____ Date _____

Make ten to solve. Use the number bond to show how you took the 1 out.

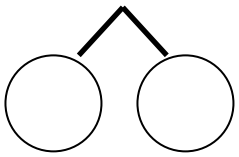
1. Sue has 9 tennis balls and 3 soccer balls. How many balls does she have?

9 + 3 = _____ 10 + ____ = ____



Sue has _____ balls.

2. 9 + 4 = _____ 10 + ____ = ____



Use number bonds to show your thinking. Write the 10+ fact.

3. 9 + 2 = _____ _____ + _____ = _____

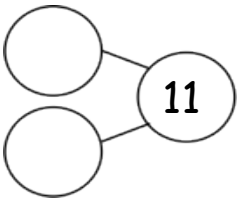
4. 9 + 5 = _____ _____ + _____ = _____

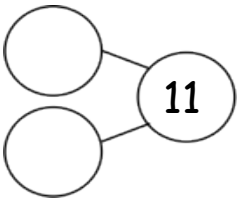
5. 9 + 4 = _____ _____ + _____ = _____

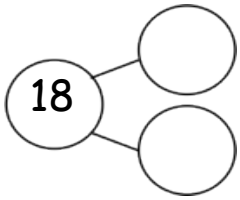
6. 9 + 7 = _____ _____ + _____ = _____

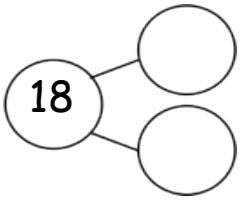
7. 9 + _____ = _____ 10 + 7 = _____

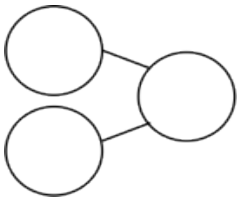
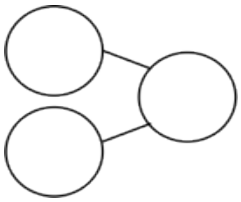
Complete the addition sentences.

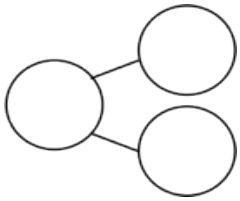
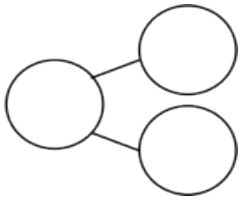
8. a. 10 + 1 = _____ 

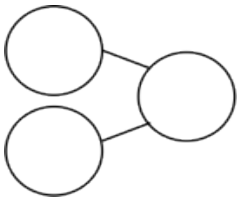
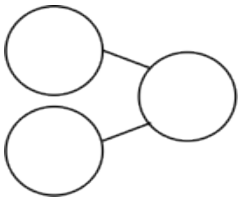
b. 9 + 2 = _____ 

9. a. 10 + 8 = _____ 

b. 9 + 9 = _____ 

10. a. 10 + 7 = _____ 
b. 9 + 8 = _____ 

11. a. 5 + 10 = _____ 
b. 6 + 9 = _____ 

12. a. 6 + 10 = _____ 
b. 7 + 9 = _____ 

Science

Engineering and Design Process Background Information for Teachers, Parents, and Caregivers

Grade Levels: K-3

This page provides information to support educators and families in teaching K-3 students about engineering and design process. It is designed to complement the Engineering and Design Process topic page on BrainPOP Jr.

Remind children that engineering is the area of science and technology that explores designing, building, and improving things to solve problems. Explain that engineers often collaborate, or work together, to solve a range of different problems from inventing tools that allow us to gather information about our world to building homes and planning cities, and much more! Lead a discussion about contributions made by the engineering and design community.

Review that engineers follow a process for solving problems. First they find and understand a problem. Invite children to think of a problem. What do people struggle with every day? What do people do or use that can be improved? Encourage children to think of a way to improve an invention that already exists. Recall that in the movie, the problem was the squirrels were eating the food in the birdfeeder. Annie and Moby understood that they needed to engineer a way to prevent the squirrels from getting inside the feeder.

The next step in the process is gathering information about the problem. Encourage children to research the problem they identified. Explain that this might include reading books, looking online, or talking to an expert. Have them take notes, draw pictures, take photos, or record video. Remind children that in the movie, Moby video recorded the squirrels to understand how they were getting into the birdfeeder.

The next step of the process is to make a plan. Using information they've gathered about the problem, engineers brainstorm different ways to solve it. Encourage children to draw pictures or make models of different ideas. Invite them to explore more than one design, and then list a step-by-step plan to test their design, including the required materials.

The final step is to test and improve the design. As children carry out their plan, have them observe by taking notes and collecting data to see if their design solves the problem. Tell them not to be discouraged if their first plan doesn't work. Explain that when a design isn't successful, engineers explore what did and didn't work, and come up with a new design to test. Some of the most important inventions were made by engineers and designers whose ideas didn't always work. They approached the problem in a different way to solve it!

Finally, it's important to explain to children that they can jump around the engineering and design process. If a plan doesn't work to solve a problem, they can go back and improve the design and test again. If the improvement still isn't successful, children can go back and brainstorm more ideas that solve the problem and choose a different idea to plan and test.

Making Observations Background Information for Teachers, Parents and Caregivers

Grade Levels: K-3

This page provides information to support educators and families in teaching K-3 students about making observations. It is designed to complement the Making Observations topic page on BrainPOP Jr.

Help children develop science inquiry skills and empower them to ask questions and make observations about the world around them. In this movie, children will learn different ways to make observations. This movie can be helpful as a review before beginning science projects or experiments. We highly recommend revisiting the movie throughout the school year.

Remind children that when they observe, they pay close attention to something. They use their five senses to observe–seeing, hearing, touching, smelling, and tasting. Review the five senses with children and pick something to observe together, such as an apple. How does it look? Take a close look at the apple together and describe it. Remind children to observe it closely, noting its color, size, and shape. Remind them to look at all of its different parts. How does it smell? Have children compare it to other smells they know. Does it smell sweet like candy or a flower? Does it smell sour like a lemon? Then have them feel it, noting its weight and texture. Is it light or heavy? Is it smooth or bumpy? Is it soft or hard? Then have your students listen to the apple. How does it sound? While some objects don't make sound on its own, they make sound when you interact with them. Take a bite of the apple. What do you hear? Have children note how the apple tastes. Is it sweet, sour, crunchy, or soft? It is important for children to understand that they should only touch or taste something if an adult says it is safe. Encourage them to find other ways to describe the apple.

Remind children that when scientists observe something, they often look at it from different angles. Things can look different from different places. They also take their time to observe since things can change in surprising ways over time. Some scientists spend years studying the same thing and learn more and more as time goes on. Observe the weather with children. What is the weather like in the morning, afternoon, and night? How does the temperature change? If you chart the weather on a daily basis, you can look back over your calendars from the past months and observe how the weather changes over time and seasons. Help children understand that making observations over an extended period of time aids them in gathering more accurate information about something. What if you only recorded temperature at night? It would be difficult to understand how the temperature changes over the course of a day, week, month, or year.

Children should be familiar with different tools that can help them observe. Magnifying glasses and microscopes can help them see things up close, while binoculars enable them to see things that are far away. Rulers and measuring tapes allow them to measure length, width, and height, while scales help them measure weight. Balances help people compare different objects. Thermometers let them record how hot or cold something is. Children can use stopwatches and clocks to time something. Encourage them to use many different tools when they observe, and to learn what each tool best aids their observations.

Remind children that recording their observations is just as important as making them. They may want to write their observations in words or numbers. For example, the apple is red, shiny, and smooth and has six seeds. They may want to draw pictures, take photos, make videos, or even record sound. Encourage them to be thorough and creative. They should take notes and organize their observations in a chart, diagram, or other graphic organizer. Different organizers work best for different objects, so arm

children with a variety of tools they can use as they observe and find the one that's best for them. It is important that children learn to be neat and organized when recording their observations, because they will need to be able to find and read the results at a later date.

When scientists make observations, they learn the world around them and help answer questions. They can use what they learned to make predictions and their observations often lead to more questions and investigations. Help children develop strong inquiry skills and foster their curiosity and a love of science.

Science Projects Background Information for Teachers, Parents and Caregivers

Grade Levels: K-3

This page provides information to support educators and families in teaching K-3 students about science projects. It is designed to complement the Science Projects topic page on BrainPOP Jr.

Doing science projects is a fun way for children to explore the world around them, while developing critical thinking and research skills. Remind children that when they do a science project, they follow the scientific method. They ask a question, make a hypothesis, plan and carry out an experiment, observe and record data, draw conclusions, and share their results with others. We recommend screening BrainPOP Jr.'s movie on the Scientific Method for review.

Children can get ideas for science projects just by looking at the world around them and ideas can strike at any time. Encourage children to carry notebooks with them and jot down any questions and ideas. Some children may wonder how a toy works, what causes a natural phenomenon, or wonder how people affect the environment. Some children may want to investigate a claim made by a commercial or advertisement or build a model to illustrate a scientific principle. Children can also get science project ideas from the myriad of resources available at the library and on the Internet. Remind children that they should choose a topic they are interested in and want to explore further. Science projects can take weeks or months, so it's important that they are interested and excited about their topics, and that they choose topics which are suitable for their time frame. Children should learn to plan ahead and assess whether or not they have enough time and resources to complete their proposed project. They may need to revise or rethink their project in order to complete it on time. Encourage children to research different topics and pick the right one for them, their resources, and their schedule.

The first step of the scientific method is to ask a question and set a purpose. Remind children that a good question is clear, simple, and specific. Children should be able to come up with a test that can answer the question. This may require further research and fine-tuning a question to fit the purpose of the project. Some children may ask a question that cannot be answered through a science project or is too challenging. Provide guidance to teach them to simplify their question into one that can be answered through an experiment completed by themselves or with very little help from adults. Review with children that good science project questions can be yes-or-no or making comparisons. Children should understand their questions before taking any step further in the scientific process.

After children have picked questions, the next step is to make a hypothesis, or prediction. Review that when they predict, they use what they know to explain what might happen. "If. . .then" statements can help them come up with a good hypothesis. Children should write their hypotheses down before proceeding with an experiment. It is a good idea for children to reserve a special notebook for their hypothesis and future notes, to make projects easier and more organized.

The next step is to plan and complete an experiment. As children plan their experiments, remind them to keep their science project questions in mind. Does their experiment answer their question? They may need to revise their experiment plan in order to answer their question. Make sure children have enough time and resources to finish their experiments. Experiments that involve building models or growing plants can take several weeks. Explain to children that many scientists repeat their experiments in order to confirm their findings. This requires careful organization and planning in order to finish the entire project before the deadline. Encourage children to think ahead and set checkpoints and goals

throughout their projects. Have children write specific steps for the experiment and include all the materials they will need.

As they do their experiments, remind them to observe and keep detailed notes. Some may want to take photos, draw pictures, or even take videos of their experiments. They can use charts and graphs to record their data as they complete their experiments. Noting any changes as they develop will not only keep children interested, but also provide data for them to create charts to share as the project develops.

After completing their experiments, children should draw conclusions about what they saw and learned. What happened in their experiments? Which developments were expected, and which were unexpected? Children should assess whether or not their hypotheses were correct. Teach children that an incorrect hypothesis does not mean the experiment is not successful. Experiments provide an opportunity to learn and the results can be used to gain and expand knowledge.

The final step of the scientific method is to share results with others. Children can create a poster, presentation, report, or even a video on their projects. Encourage them to be creative. As children share their work, have them ask questions and think about each project. Good science projects inspire and excite people and lead them to ask more questions they can investigate or research further.

Social Studies

Reading Maps Background Information for Teachers and Parents

Grade Levels: K-3

This page contains information to support educators and families in teaching K-3 students about reading maps. The information is designed to complement the BrainPOP Jr. movie Reading Maps. It explains the type of content covered in the movie, provides ideas for how teachers and parents can develop related understandings, and suggests how other BrainPOP Jr. resources can be used to scaffold and extend student learning.

Reading maps is an important skill that even the youngest of students can learn and develop from an early age. Reading maps combines reading and math skills and helps build spatial sense and visual literacy. Remind your children that a map is a tool that shows details about an area. A map can show continents, countries, states, and cities or show the roads and landmarks of a town. It can show routes of a transportation system, such as bus or subway lines, different landforms and elevations, different kinds of natural resources, or varying temperatures in a specific area. A map can also show historical data, such as changes in population, housing development, or crime. A globe is a map on a round model that shows places on Earth. Display different maps for your children and discuss what information each map communicates. Then point out different parts of the map such as the map key or map legend, scale, and compass rose.

Review with your children that a map key or map legend is a chart that explains what symbols mean on a map. On many navigational maps, a black dot stands for a city, a star stands for a state's capital, and a star inside a circle stands for a country's capital. Airplanes stand for airports and black or yellow lines stand for highways, roads, or streets. Different maps have different symbols, though many share the same basic symbols. Remind your children that they should always look at the map key or legend to figure out what the symbols mean. There are also other symbols or markings that may not be in a typical map key. Green shading usually stands for a park; blue shading usually stands for a body of water such as a pond, lake, sea, or ocean; thin blue lines stand for rivers, streams, or creeks; and brown shading sometimes stands for deserts or plains. Non-navigational maps, such as temperature maps or rainfall maps, use different symbols, so children should look at the map key to gain a better understanding.

Many maps have a compass rose, which is a tool that displays directions. The cardinal directions are north, east, south, and west. The intermediate directions are the points in between the cardinal directions: northeast, northwest, southeast, and southwest. You may want to teach your children a mnemonic to remember the cardinal directions, such as "Never Eat Soggy Waffles" or "Never Eat Shredded Wheat." Encourage your children to come up with their own mnemonics. Many maps also have a scale, which is a tool that compares distance on a map to distance on Earth. The scale helps the user figure out real-life distances by looking at a map. For example, suppose there is a map where 1 inch represents 1 mile. Two landmarks that are 3 inches apart on the map are 3 miles apart on Earth. Different maps have different scales so children should always refer to the map key or legend to look for the scale.

Maps help people navigate, or find their way around an area. Display a simple map and have children give verbal or written directions to go from one location to another. You may wish to model an example first. Children should use sequence words, such as first, second, third, and then. We recommend watching the How-to Essay movie together as a review. They should also use language that describes direction, such as left, right, straight, and turn, and use cardinal directions and landmarks to make their directions as clear and easy as possible for the listener or reader.

Reading Maps Background Information for Teachers and Parents

Maps are not only useful tools, but they also give people a sense of place in a world. Maps vary greatly, so encourage your children to analyze maps and find different examples. Maps allow children to explore their world without having to leave their homes!