

AT-HOME SCIENCE LEARNING



#2 BOTTLE BOWLING



This project is funded by the California Collaborative for Educational Excellence in collaboration with the Office of the Fresno County Superintendent of Schools.

FOR THE TEACHER:

AT-HOME SCIENCE LEARNING

#2 BOTTLE BOWLING



Quick synopsis:

Explore force and motion by using simple supplies found around the home. Discover what happens when you bowl on different surfaces and design a device that causes the ball to move faster. These activities are designed to meet science standards for Kindergarten and 3rd grade but all children will have fun exploring.



Science Standards:

K-PS2-1	- Pushes and Pulls can have different strengths and directions.
K-PS2-2	- When objects touch or collide, they push on one another and can change direction.
3-PS2-1	- A bigger push or pull makes things speed up or slow down.
3-PS2-2	



Connections to additional content standards:

Math: Counting, adding, multiplying (older students).

ELD Part I: 1-4 – Exchanging information with others, interacting with others in a variety of forms, offering and supporting opinions, adapting language choices.



Suggestions and Tips:

- Each activity is designed to take 15-30 minutes to complete.
- Share this unit with families by printing out a “Parent Guide” and Student Journal” for each student (or you can share digitally). Give families a week or two to complete. Students can bring back their science journals to share their learning experiences with the class.
- Send an email or cover letter to families when sending out this At-Home Science Learning Unit. Suggestions for the wording you can include:
Parents, you are your children’s first and most important teachers! “At-Home Science Learning” is about you and your children exploring science in fun, hands-on ways while supporting the learning happening in the classroom. Use the “Parent Guide” to help you support your children through the activities. Each activity is designed to take 15 – 30 minutes. Get your whole family involved!



Materials/Supplies:

- Electronic device connected to the internet to watch videos, take pictures, and play games
- 10 empty water bottles or soda bottles
- A ball (any type of ball works such as a tennis ball, kickball, soccer ball, etc)
- A permanent marker



FOR THE PARENT:

#1 BOTTLE BOWLING

Overview: Explore force and motion by using simple supplies found around the home. Discover what happens when you bowl on different surfaces and design a device that causes the ball to move faster.

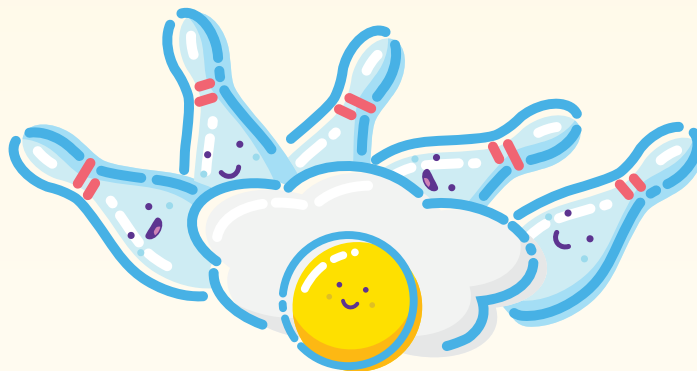
Materials/Supplies:

- Electronic device connected to the internet to watch videos, take pictures, and play games.
- 10 plastic water bottles or soda bottles filled about a small amount of water, less than half of the bottle.
- A ball (any type of ball works: tennis ball, kickball, soccer ball, etc).
- A permanent marker.
- Science Journal for each child, a pencil, and colored pencils or crayons (optional).

Each of the activities is designed to take 15–30 Minutes.

Activity 1

1. Have you ever been bowling as a family? If you have, ask your child what they remember about the bowling experience. What did they like the most? What was the most difficult?
 - a. Encourage them to share using complete sentences and give them the beginning of sentences if it helps them begin to share their thinking. For example, “The parts of bowling I remember are...”
“The most enjoyable part for me was... because...” “The most difficult part for me was... because...”.
2. Now listen to the storybook “Mitchell Goes Bowling” by going to this link on your electronic device:
tinyurl.com/book-mitchellbowling
 - a. After listening, ask your child to share with you some things they remember hearing about in the book. Again, encourage them to share using complete sentences. For example, “In the book, Mitchell...”.
3. After reading the book, have your child go to their Science Journal – Activity 1 section. Give your child time to answer the questions.
If you have younger children, read the questions out loud and let your child draw pictures as their answers.



Activity 2



1. Collect 10 plastic water bottles or soda bottles and fill the bottom of each bottle with some water, less than half full. Set up your Bottle Bowling activity in an area in your house (inside or outside) that has a flat surface and around 5–10 feet of space between the bottles and where your child will be standing to roll the ball. Use this diagram to help you set up the bottles.
2. Have your child roll the ball towards the bottles to see how many they can knock over. Set up the bottles again and have your child play multiple times. If you have multiple children, have them take turns rolling the ball. Or, partner an adult with a child to create teams and see which team can knock the most bottles over.
3. As your child is playing, ask these questions:
 - a. What do you notice?
 - b. What do you think causes the bottles to fall over?
 - c. Why don't all the bottles fall over every time?

Continue encouraging them to share using complete sentences and giving them the beginning of sentences if it helps them to share their thinking. For example,

a. "I notice..."

"I think the bottles are falling over because..." or "I think ____ is causing the bottles to fall over because..."

"The bottles don't fall over every time because..."

4. *Optional:* Use a phone or tablet to video your child bowling in slow motion. Watch the video together and talk about what you see when you watch in slow motion. Record multiple bowling attempts and watch what is really happening!
 - a. Remember to have them try to talk using complete sentences. For example, "I see..." or "I notice..."
5. After playing multiple rounds, have your child go to their Science Journal – Activity 2 section. Have your child respond to the prompts.

Activity 3

1. It's time to find different surfaces around your home to set up your bowling game. Go outside and bowl on the grass, the dirt, or the sidewalk. Inside, bowl on the carpet and the tile or other smooth surface.
2. Ask your child to predict what they might have to do differently when rolling the ball to the bottles on the different surfaces. Will they have to roll the ball harder? Why or why not? Will the different surfaces keep the bottles from falling over? Why or why not? While bowling on the different surfaces, ask your child if they are having to push the ball harder in order to knock down the bottles. Why? After bowling on different surfaces around your house, have your child go to their Science Journal – Activity 3 and record what happened.
 - a. Remember to have them try to talk using complete sentences. For example: "I noticed that...", "I had to roll the ball harder when...", "I think this is because..."
 - b. They can also use these statements when they write to help them write using complete sentences if it is age-appropriate.
3. Your child may have noticed that it was harder to roll the ball on certain surfaces, such as carpet and grass compared to smooth surfaces. They might say they had to push the ball harder on some surfaces to make it go. This "push" is a force that makes things move. Your child will start understanding that sometimes they have to use a stronger force to move something.

Activity 4

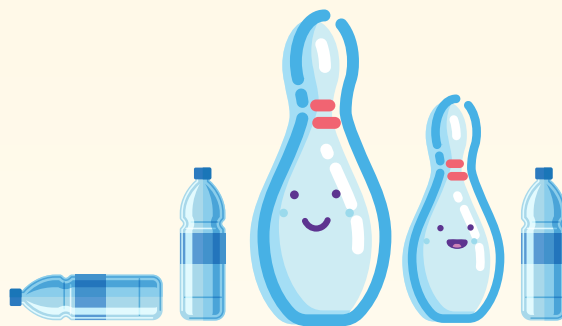
1. On an electronic device, go to this website: <https://pbskids.org/ruff/games/fish-force>
2. In this online activity, your child will be given different challenges in which they have to push a fish on the ice to move a toy to a target. Your child will investigate different strengths and angles of forces. Your child can also create their own challenges that you can try to complete.
3. When done with the challenges, have your child go to their Science Journal – Activity 4, and record what they learned about forces.

Activity 5

1. Using a permanent marker, write the numbers 1 through 10 on the water bottles, each bottle gets one number.
2. Set up the bowling game again. Have your child roll the ball to knock down the bottles. Now have your child add up the numbers on the bottles that fell down. They can use their Science Journal – Activity 5 to write their answers. (Example: Jack knocked down 4 bottles and the numbers on these bottles were 1, 5, 6, and 8. Jack writes down these numbers and adds them together in their Science Journal – Activity 5.)
3. If you have older children, you can have your child multiply the numbers on the bottles that are knocked over for a bigger math challenge.
4. Have a family competition! Each member of your family (or you can work in adult/child teams) takes a turn and adds up the numbers on the bottles knocked down. Keep track of each person's (or team's) score. Take turns until someone (or one of the teams) reaches 100 points.

Activity 6

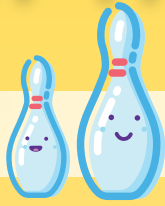
1. Engineering challenge: Using items around your house, work together with your child to create a “ramp” that will move the ball faster towards your bottles which will hopefully knock more bottles over. Be creative! Let your child create and test multiple ideas using different materials and different designs. Once your child has created their best ramp, have them draw and label their ramp in their Science Journal – Activity 6.



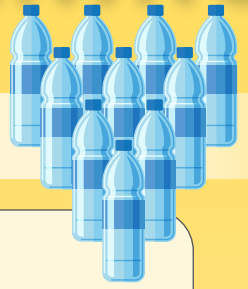
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AT-HOME SCIENCE LEARNING

#1 BOTTLE BOWLING



NAME: _____



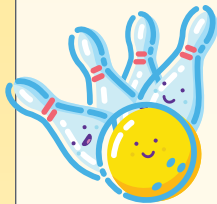
Activity 1: Story



Listen to the book “Mitchell Goes Bowling”

Why do you think Dad was able to knock down all of the bowling pins but Mitchell was only able to knock a few down?

Activity 2: Bottle Bowling



What did you notice while bowling? Draw  or write  your response. “I noticed...”.

Were you able to knock down the bottles every time you rolled the ball?
Why or why not?

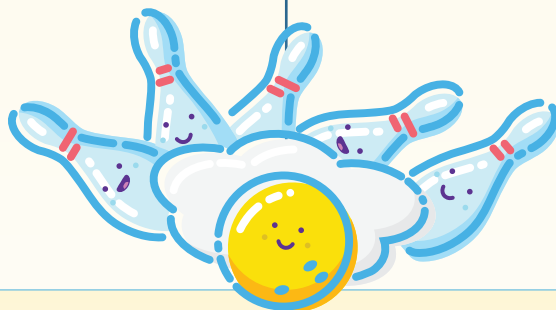
Activity 3: Bowling on Different Surfaces

Choose 2 different bowling surfaces to record your observations.

What surface did you test? What happened? What questions do you have?

SURFACE: _____

SURFACE: _____



Activity 4: Online Challenges

Helping Ruff Ruffman push his toy to the target was challenging!

Draw  or write  your response.

What happened when you used a strong force?

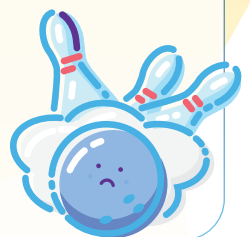
When I used a strong force, _____

What happened if you didn't use a strong enough force?

If I didn't use a strong enough force, _____

What happened when you pushed the toy over the sand?

When I pushed the toy over the sand, _____



Activity 5: Number Bowling

Add up the numbers of the bottles you knock over.

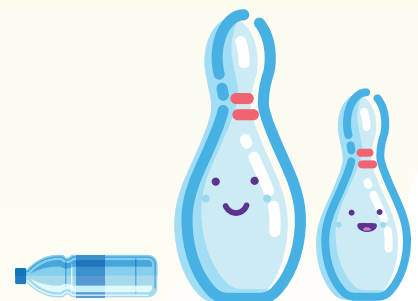
Round 1

Round 2

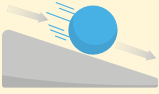
Round 3



Optional Family Challenge: Add up the numbers on the bottles knocked down.
The first person to 100 wins!



Activity 6: Ramp Design

Draw your best ramp  design. Label the different materials you used. Explain why this ramp worked well in knocking over more bottles when you bowled.

