Lesson 1.2
Talking About Forces
Lesson Overview

Students begin to talk about forces using their own words. First, they play a game called Rugball, which involves moving a ball across the carpet and describing its movement. Next, they examine a slideshow featuring images of objects starting to move, visualizing the movement of the objects. Students practice using the word because to explain a variety of everyday events, which serves as an introduction to the crosscutting concept of Cause and Effect. They listen to this language again and practice using the visualizing strategy as the teacher reads aloud the first book in the unit, Talking About Forces. This book exposes students to scientific language, including using the vocabulary words force and exert to describe movement. The purpose of this lesson is to connect students’ discoveries about movement with scientific language, which, in turn, prepares them for explaining forces when they build their Box Models to test how a pinball machine works.

Anchor Phenomenon: Pinball machines allow people to control the direction and strength of forces on a ball. Everyday Phenomenon: The rugball moves in different ways.

Students learn:

• An object starts to move when another object exerts a force on it.
• Visualizing is making a picture in your mind and it can be used to notice forces.
• Scientists often talk about how things are connected.
• Scientists and engineers search for cause and effect relationships to explain natural events.
Reading: Talking About Forces

Teacher reads aloud *Talking About Forces*, stopping to practice both visualizing and using scientific language about exerting forces.

Instructional Guide

1. **Transition to the discussion area as a way to highlight the word because.** Ask students to move from the circle to a place where everyone can see. Point out that you noticed students moving *because* you asked them to find a new spot.

2. **Introduce *Talking About Forces* by discussing the cover.**

Let students know that when scientists and readers gather information from books, they often visualize, or make a movie in their mind, what is happening in the pictures and words.

- When I am reading a book, I look at the pictures and try and visualize what is happening. As I start to read, I am going to look at the cover and title of this book, as well as all the pictures, and visualize.

- What do you notice on the cover of this book?  
  [A boy is kicking a ball, the ball is moving.]

  Rephrase student contributions using the *because* explanation language frame.  
  [The ball is moving because the boy is kicking it.]

- This book is about children who make objects start to move, and it tells us how scientists and engineers might explain what happens.

3. **Set purpose for reading.**

- Today we will read to find out more about how we talk about forces.

4. **Begin to read aloud the book.**

5. **Pause after the first paragraph on page 5 to model visualizing a push.**
Demonstrate a pushing hand motion in which you push your hands away from your body. Ask students to gesture with their hands the movement of pushing a swing.

6. Read aloud page 6 and connect your visualization to scientific language, using the words force and exert.

Pushing is exerting a force.

Gesture away from your body. Ask students to do the same pushing gesture while they repeat: Pushing is exerting a force.

7. Pause after the first paragraph on page 7 and think aloud to model visualizing a pull. Talk about what you visualize and include a pulling hand motion in which you pull your hands toward your body. Ask students to gesture with their hands the movement of pulling a wagon.

8. Read aloud page 8 and connect your visualization to scientific language, using the words force and exert.

Pulling is exerting a force.

Gesture toward your body. Ask students to do the same hand gesture while they repeat: Pulling is exerting a force.

9. Pause after the first paragraph on page 9 and think aloud to model visualizing a throw. Talk about what you visualize and include a hand motion where you pretend to hit the ball. Ask students to gesture with their hands.

10. Read aloud page 10 and connect your visualization to scientific language, using the words force and exert.

Have students join you in gesturing a throwing motion.

Throwing is exerting a force.

11. Note the cause–and–effect language on page 10.

The book says the ball moved because Mia exerted a force on it. This sentence connects when the ball moves to Mia exerting a force on it.

Have students repeat the phrase as they gesture throwing.

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

12. Have partners talk about page 11. Show the picture on page 11 and ask students to visualize what is happening in the photo.
1133. Read aloud page 12. Point out the word because in the sentence.

Have students gesture a kicking motion with you.

The book says the ball moved because Jess exerted a force on it. Kicking is exerting a force.

14. Continue reading through page 13. You will return to the photographs on pages 14 and 15 in a later lesson.

15. Wrap up the Read-Aloud and conclude the lesson by previewing future learning. Remark at how much students are learning about forces.

We are really starting to talk like pinball engineers!

Let students know they will keep figuring out how forces work in the next lesson so that they can get ready to start working on their pinball machines.

Teacher Support

Background

About the Book: Talking About Forces

Talking About Forces introduces students to several foundational concepts for the unit, including the idea that forces make things move. The book also introduces key scientific language for explaining what is happening when a force makes something move. Students learn that scientists and engineers say that when one thing is making another thing move, it is exerting a force on it. Relatable examples and photographs help students connect the concepts they are learning in the unit with what they see in the world around them. The book helps students view the world through a scientific lens and see how forces are being exerted all the time. Talking About Forces is used as a Read-Aloud book at the beginning of the unit to introduce the content and help students connect movement with the forces that cause it to happen.

Rationale

Literacy Note: Approach to Reading

The books in this unit are designed to gradually increase students’ responsibility for reading science texts. All kindergarten units include several books designated as Read-Alouds that are designed to provide students with an introduction to the language of science they will come to use in their discussions and in later reading. In a Read-Aloud, the teacher models fluent and expressive reading of the text and verbally interacts in order to model strategic reading, thinking aloud about the content, introducing new vocabulary, and facilitating students’ comprehension of the text. This allows students to become increasingly familiar with reading strategies and with the content of the unit. As the unit progresses, students will take more responsibility for reading when they engage in Shared Reading of other unit texts. By structuring reading instruction in this way, students have multiple experiences with the content and vocabulary of the unit while also developing strategies for reading to learn from science texts.
Background

Literacy Note: Purpose of Read-Aloud Books
The Read-Aloud books in this unit serve many purposes. During this Read-Aloud, you will stop at key points to model visualizing, invite gesturing, and point out key science ideas. In this lesson, the focus is on visualizing why objects or people start to move. Students will also be guided to making sense by using gestures to push or pull objects. Depending on time available, you may choose to pause and provide additional opportunities for partners to discuss ideas from the text. In the lesson, you may be directed to stop reading before getting to the end of the text. After reading the last few pages of this book in an upcoming lesson, you may wish to read the entire book aloud at least one more time during the unit. An additional read will build familiarity with the content and vocabulary.

Rationale

Pedagogical Goals: Understanding the Nature of Science
One goal set forth by the Next Generation Science Standards (NGSS) is for students to understand the nature of science as a discipline and how scientific knowledge develops over time. The NGSS calls out eight understandings about the nature of science that are woven throughout the Amplify Science curriculum. This unit gives students an opportunity to experience the understanding that Scientific Models, Laws, Mechanisms, and Theories Explain Natural Phenomena. Specifically, the informational text Talking About Forces illustrates the idea that scientists search for cause-and-effect relationships to explain natural events.
Reading: Talking About Forces

Teacher reads aloud *Talking About Forces*, stopping to practice both visualizing and using scientific language about exerting forces.

Instructional Guide

1. Transition to the discussion area as a way to highlight the word *because*. Ask students to move from the circle to a place where everyone can see. Point out that you noticed students moving *because* you asked them to find a new spot.

2. Introduce *Talking About Forces* by discussing the cover.

   Let students know that when scientists and readers gather information from books, they often visualize, or make a movie in their mind, what is happening in the pictures and words.

   Quando estoy leyendo un libro, miro las imágenes e intento visualizar lo que está sucediendo. Al comenzar a leer, voy a mirar la portada y el título de este libro, así como las imágenes, y voy a visualizar.

   ¿Qué notan en la portada de este libro?
   [Un niño está pateando una pelota, la pelota se está moviendo].

   Rephrase student contributions using the *because* explanation language frame.
   [The ball is moving because the boy is kicking it.]

   Este libro trata sobre niños que hacen que los objetos comiencen a moverse, y nos dice cómo los científicos e ingenieros podrían explicar lo que sucede.

3. Set purpose for reading.

   Hoy leeremos para averiguar más sobre cómo hablamos acerca de las fuerzas.

4. Begin to read aloud the book.

5. Pause after the first paragraph on page 5 to model visualizing a push.
En mi mente, puedo imaginar a Scott usando sus manos sobre la espalda de Francis para empujarla en el columpio.

Demonstrate a pushing hand motion in which you push your hands away from your body. Ask students to gesture with their hands the movement of pushing a swing.

6. Read aloud page 6 and connect your visualization to scientific language, using the words force and exert.

Empujar es ejercer una fuerza.

Gesture away from your body. Ask students to do the same pushing gesture while they repeat: Pushing is exerting a force.

7. Pause after the first paragraph on page 7 and think aloud to model visualizing a pull. Talk about what you visualize and include a pulling hand motion in which you pull your hands toward your body. Ask students to gesture with their hands the movement of pulling a wagon.

8. Read aloud page 8 and connect your visualization to scientific language, using the words force and exert.

Jalar es ejercer una fuerza.

Gesture toward your body. Ask students to do the same hand gesture while they repeat: Pulling is exerting a force.

9. Pause after the first paragraph on page 9 and think aloud to model visualizing a throw. Talk about what you visualize and include a hand motion where you pretend to hit the ball. Ask students to gesture with their hands.

10. Read aloud page 10 and connect your visualization to scientific language, using the words force and exert.

Have students join you in gesturing a throwing motion.

Tirar es ejercer una fuerza.

11. Note the cause–and–effect language on page 10.

El libro dice que la pelota se movió porque Mia ejerció una fuerza sobre ella. Esta oración conecta el movimiento de la pelota con la fuerza que Mia ejerce sobre ella.

Have students repeat the phrase as they gesture throwing.

La pelota se movió porque Mia ejerció una fuerza sobre la pelota.

12. Have partners talk about page 11. Show the picture on page 11 and ask students to visualize what is happening in the photo.
Lesson 1.2
Activity 4

Pushes and Pulls
Lesson Guides

Hablen en parejas sobre cómo se movió la pelota.  
[Fue pateada. Rebotó por el pasto].

13. Read aloud page 12. Point out the word *because* in the sentence.

Have students gesture a kicking motion with you.

El libro dice que la pelota se movió porque Jess ejerció una fuerza sobre ella. Patear es ejercer una fuerza.

14. Continue reading through page 13. You will return to the photographs on pages 14 and 15 in a later lesson.

15. Wrap up the Read-Aloud and conclude the lesson by previewing future learning. Remark at how much students are learning about forces.

¡Realmente estamos comenzando a hablar como ingenieros de pinball!

Let students know they will keep figuring out how forces work in the next lesson so that they can get ready to start working on their pinball machines.

Teacher Support

Background

About the Book: *Talking About Forces*

*Talking About Forces* introduces students to several foundational concepts for the unit, including the idea that forces make things move. The book also introduces key scientific language for explaining what is happening when a force makes something move. Students learn that scientists and engineers say that when one thing is making another thing move, it is exerting a force on it. Relatable examples and photographs help students connect the concepts they are learning in the unit with what they see in the world around them. The book helps students view the world through a scientific lens and see how forces are being exerted all the time. *Talking About Forces* is used as a Read-Aloud book at the beginning of the unit to introduce the content and help students connect movement with the forces that cause it to happen.

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