

Unit 7 (Mechanisms): Exploring Wheels and Axles

Concept

Mechanisms are parts of structures which create or use motion. Wheels are mechanisms.

Content Objective

Explore shapes that do and do not roll.

Language Objectives

Students will use the following high-frequency English words to identify and discuss different kinds of movement and vehicles: *roll, slide, float, vehicle, boat, sled, bicycle, bus*

Students will listen to the teacher orally explain the Design Brief task, and will orally share questions they have

Students will orally share their ideas and work putting a wheel on a cereal-type box in order to make the wheel turn.

Standards

- **NGSS:**

- **K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define problem that can be solved with a new or improved object or tool.

- **TEKS:**

- **1A** identify and demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including wearing safety goggles, washing hands, and using materials appropriately (identify)
- **2B** plan and conduct simple descriptive investigations such as ways objects move (investigate movement)
- **3B** make predictions based on observable patterns in nature such as the shapes of leaves (predict from patterns)
- **4A** collect information using tools, including computers, hand lenses, primary balances, cups, bowls, magnets, collecting nets, and notebooks; timing devices, including clocks and timers; non-standard measuring items such as paper clips and clothespins; weather instruments such as demonstration thermometers and wind socks; and materials to support observations of habitats of organisms such as terrariums and aquariums (use tools)
- **6D** observe and describe the ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow (how objects move)

- **ELPS:**

- 1A Use prior knowledge and experiences to understand meanings in English.

- 4A Learn relationships between sounds and letters of the English language to represent sounds when writing in English.
- 1C Use strategic learning techniques such as concept mapping, drawing, memorizing, comparing, contrasting and reviewing to acquire basic and grade-level vocabulary.

Suggested Literature Connections:

“Wheels!” by Annie Cobb

Materials:

Assorted objects to test (e.g., cereal or oatmeal boxes; cans; milk cartons; cardstock paper; spools; paper towel rolls; ping pong balls; wooden blocks; funnel; marbles; dominoes; toy car)

Day 1: Engage/Explore

Teacher Says/Does	Student Says/Does	Language requirements
<ol style="list-style-type: none"> 1. Gather all students on the rug and show three or four objects from the materials list. Or show pictures for these materials in the handout (K.7.1). Ask the following questions: <i>What is this? What is it for?</i> Invite students to point out and name each of the objects and share what they know about them. 2. Divide the students into pairs and give each pair one object from the materials list that either rolls or slides. 3. Demonstrate and discuss how some objects will roll and others will slide. 4. Ask pairs of students who have objects that can roll to stand up. Have each pair demonstrate why they can think the object rolls. 5. Next, ask pairs of students who have objects that slide to stand up. Have them take turns to demonstrate why they think their object slides. 6. Show them the <i>The Little Engine that Could</i> video: https://www.youtube.com/watch?v=8EhpgcXoxGI 7. Show students a picture of a toy car. <i>What has to happen before a toy car can roll?</i> Give students toy cars and have them describe what is happening as the wheel turns. Let them explain to each other. 	<p>Students point at objects in the material list or at pictures on handout and share what they know about them.</p> <p>Students share words that rhyme with "slide" and with "roll"</p> <p>Student pairs explain their understanding of sliding and rolling objects</p> <p>Students share what they know about cars</p>	<p>This is a _____ It is used for _____</p> <p>One word that rhymes with slide is _____ One word that rhymes with roll is _____</p> <p>We think this object slides because _____</p> <p>We think this object rolls because _____</p>

Day 4: Elaborate

Teacher Says/Does	Student Says/Does	Language requirements
<ol style="list-style-type: none">1. Have the teams present some of their ways of attaching moving wheels. These students can advise others during design brief work.2. Explore further by testing various objects on the playground slide after predicting which ones will slide, roll, or limp, etc., down the slope3. Have students continue the exploration with rolling, sliding objects, by doing one of the following in different groups: cutting out pictures of things that roll and slide and making a collage	<p>Student teams make a short presentation explaining how they attached a wheel on their cereal-box</p> <p>Students talk about playground objects and decide which ones slide, roll, limp</p> <p>Students make a collage with objects that roll or slide</p>	<p>Vocabulary: roll, slide, limp, collage</p>

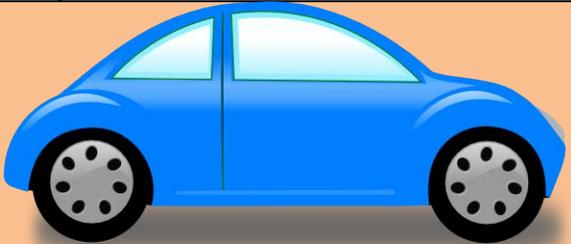
Examples of Materials:



rolls

slides

Name: _____ Date: _____

Object	rolls	slides
	✓	
		
		
		
		