

Science Lesson Plan

Title: Rolling Cups, investigation 4 part 2
Topic/Strand: Balance and Motion-Rollers
Grade level: 2nd
Teacher: Lorena Reyes
Estimated time: 50 minutes

1. Overview:

In Investigation 4: Rollers, students continue to explore and learn more about balance and motion through rolling systems such as wheel-and-axel systems, systems with wheels of different sizes, wheel systems that are weighted in strange ways, and rolling-sphere systems. In addition, students also gain more experience with gravity and force (push or pull). This lesson is based on the FOSS Balance and Motion curriculum.

Part 2 of this investigation has students investigating rolling cups. Students will get to apply their knowledge of the previous lesson by predicting, investigating, and recording their findings as to how the paper cups roll off a ramp. After a classroom discussion on the investigation, students will read a related text about the focus question and then take a quick end-of-lesson quiz.

2. Learning Goals and Standards

Science Learning Goals:

1. Students will come to know and understand that an object's motion can be described by recording the starting and ending position of a paper cup. (PS1b)
2. Students will come to know and understand that to change how something is moving there is either a push or a pull. (PS1c)
3. Students will come to know and understand that scientific progress is made by making predictions and conducting careful investigations to verify their predictions, which they need to be able to express orally and in writing. (PS6A, PS 6G)

Language learning Goals:

1. Students will be able to effectively communicate their findings to classmates and the teacher orally and in writing. (ELD1, ELD2)
2. Students will be able to use concepts and academic vocabulary to complete writing activities that support concept development related to the study of motion. (ELD1)
3. Students will be able to follow multi-step directions given verbally and in written form. (ELD2)

Standards Addressed

California Grade 2 Physical Sciences Standards

1. The motion of objects can be observed and measured. As a basis for understanding this concept: b. Students know an object's motion can be described by recording the change in position of the object over time. c. Students know the way to change how something is moving is by giving it a push or a pull. The size of the change is related to the strength, or amount of force, of the push or pull.

California Grade 2 Investigation and Experimentation Standards

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other

three strands, students should develop their own questions and perform investigations. Students will:

- a. Make predictions based on observed patterns and not random guessing.
- d. write or draw descriptions of a sequence of steps, events, and observations

English Language Arts Standards (2nd Grade)

Listening and Speaking

- Comprehension 1.4 Give and follow three and four-step oral directions
- Organization & Oral Communication 1.6: Speak clearly and at an appropriate pace for the type of communication
- Organization & Oral Communication 1.9: Report on a topic with supportive facts and details

English Language Development (ELD) standards K-2nd Grade.

1. Writing

- Language Conventions (Early Intermediate/Intermediate):
 - Write simple sentences by using key words posted and commonly used in the classroom. (p. 15) EI
 - Produce independent writing that may include inconsistent use of capitalization, periods, and correct spelling. (p. 18) I

2. Listening and Speaking

- Comprehension, Organization, & Delivery of Oral Communication (Early Intermediate) (Intermediate):
 - Begin to be understood when speaking but may have some inconsistent use of standard English grammatical forms and sounds. (p.1) EI
 - Ask and answer instructional questions by using simple sentences. (p.17) I
 - Apply knowledge of content-related vocabulary to discussions and reading. (p. 9) I
 - Understand and follow some multiple-step directions for classroom related activities. (p. 12). I

3. Assessments

Teacher: Formative assessment record sheet to record observations made throughout the lesson

Students: Science notebooks, Exit ticket, oral responses

Learning goal	Data sources
PS1B&C	<ul style="list-style-type: none">• Exit Ticket• Science notebooks• Student verbal responses and talk
I&E6 A&D	<ul style="list-style-type: none">• Student verbal responses and talk• Science notebooks
ELD1	<ul style="list-style-type: none">• Exit Ticket• Science notebooks
ELD2	<ul style="list-style-type: none">• Student verbal responses, peer conversations

4. Resources and Preparation

Visuals:

- cognitive content dictionary (word, definition, picture, and oral sentence) –from previous lesson
- sentence frames
- word wall
- sentence strip with focus question

Materials:

- cardboard ramp
- clothespins
- large paper cups
- small paper cups
- tape

Handouts:

- exit ticket

5. Instructional Plan

Segment/Activity	ELLISA Practice	Vocab
Prepare to investigate ~ 6 minutes Review(5min): What were some key concepts that we learned in yesterday's lesson? Pair-share, 4 students share whole class Goals for today (1min): Today you will continue to investigate and learn more about motion. By the end of the lesson you will be able to answer our focus question: How can you change how a cup rolls down a slope? CX: Ask students: What things have you seen roll down a slope or hill? Anticipated responses: cars, bicycles, skateboards, scooters, roller skates, roller blades, matchbox cars	CX-school work LS	Investigate Question Motion Slope Direction
Investigation 4 Part 2: Rolling Cups ~30 min I. Introduce cups (2min) Wheels are not the only things that roll. What are some things that roll based on student responses? What do these rollers have in common? Cups also roll. In today's investigation you will each get one large and one small cup to investigate and see how they roll. Just like yesterday we are going to set up our science journals before investigating. This will help us record our predictions and observations so that we can later reference that information. Go to your seats and take out your scientific journal.	 LIT	

II. Prepare Notebooks/Investigation (10min) (LIT) Write the title of the investigation rolling cups (model on board). Remember that scientists and people in general title their work to help them remember and to let other people know about their writing. It's important to write the date to keep a record of our information. You need to divide your journal in half and draw a vertical line. Then you will need to draw 3 horizontal lines. In the first column you will draw your predictions as to where you think the paper cup will roll when you let it go. In the next column you will record the direction of where the paper cup actually rolled. We will practice the first one together as a class and then you are going to do it on your own. Remember that as scientist we need to be as accurate as possible with our illustrations and labeling because we will be looking at them again. Also someone may want to try to do the same lesson using your notes; and if they can't understand or read your writing, they won't be able to.		LS	
Prediction (student drawing) I think the larger paper cup will _____ because _____.	Actual (student drawing) The larger paper cup rolled to the _____.	ELD	
III. Small Group Conversations/Observations (10 minutes) (IC) Will circulate around the room, engage in instructional conversation, and collect formative assessment data. What have you noticed? I see that you predicted that it would roll _____ but when you rolled the paper wheels, you observed that _____. Why did you think this at first (pointing at the prediction drawing)? What did you notice? Do you now see a pattern? What differences do you notice from the bigger cup and the smaller cup? How can you change how a paper cup rolls?		IC	
IV. Class discussion/Wrap up to Investigation ~ 10 min (IC) Why did the cup roll in a circle? (There is a big circle-wheel-at one end and a small one at the other) What determines which direction the cup will roll? (cups roll in the direction of the bottom, smaller circle. Why? Does the smaller cup roll in a bigger circle or a smaller circle than the larger cup? (smaller) Why? How can you change how a paper cup rolls? <ul style="list-style-type: none"> • What will happen if you [do what the student describes in response to the first question]? • Why will [doing what the student describes] make the cup roll [in the way that the student describes in response to the second question]? 		LIT	
		IC	

<p>Exit ticket:</p> <p>Exit Ticket: Part of the science notebook where students write scientific conclusions or reflections. For example, they could begin a quick write with:</p> <p>“Today I learned”,</p> <p>“The evidence shows....”.</p> <p>“Our results show...”,</p> <p>“The rollersbecause....”</p> <p>“It’s important to understand motion because...”</p>		
<p><u>V. Extension- (time permitting) ~ 10 min</u></p> <p><i>Reading</i></p> <p>(Vocab) Scientists get information from their investigations but they also read to learn more about what they are investigating. Everyone open your books to the table of contents. Now find where it says Rolling, Rolling, Rolling! What page is that section located in? Open to that page. (Pages 21-26).</p> <p>Now that we have read more about motion and with our own knowledge that we have gained throughout the investigations I want to ask you: Why is it important to learn about motion? (teacher records information on chart paper).</p> <p>If there is time, it might be interesting to ask students what they might be interested in learning more about with regards to rolling, ramps or motion.</p> <p>-partner share “sentence stem” or share what they wrote...</p>	<p>LIT</p> <p>CX</p>	

NOTE ELLISA PRACTICES

1. Authentic Science Literacy (LIT)
2. Science Vocabulary (Vocab)
3. English Language Development (ELD)
4. Scaffolding Science Content (SDAIE)
5. Contextualizing Personal-Home-Community-Experiences (CX-Home)
6. Contextualizing Physical & Local Environment (CX-Local)
7. Instructional conversations (IC)

6. Related Resources

FOSS, G.L.A.D.