

Lesson: Pom Pom Drop (Physics)



www.sylvanlearning.com/blog/index.php/explore-gravity-with-a-pom-pom-drop/

Suggested Group Size: Small Group

Objective(s): Students will be able to observe and explore the effects of gravity

Activity:

Students will to create and experiment with simple pom pom drops. They will design and test their own pom pom drop, in an open-ended process that allows children to test different designs and types of pompoms and see how gravity affects each.

Targeted Florida Early Learning and Developmental Standards for Four-Year-Olds

- V. Cognitive Development and General Knowledge
 - A. Mathematical and Scientific Thinking
 - E. Spatial Relations
 - A.e.1. Shows understanding of spatial relationships and uses position words
 - A.e.3 Understands and can tell the difference between orientation terms (e.g. horizontal, diagonal, vertical)
 - B. Scientific Inquiry
 - A. Investigation and Inquiry
 - B.a.2. Examines objects and makes comparisons

Materials

- Book: ***The Lorax*** by Dr. Seuss
- magnetic board (or poster board)
- pompoms
- cardboard cylinders (paper towel or toilet paper rolls) painted assorted colors. If using a magnetic board, attach magnet strips.
- Tape (if using poster board)



Preparation prior to lesson:

1. Paint cardboard cylinder varying colors
2. Attach magnetic strips to one side of each tube (if using magnetic board)
3. Sort pompoms

Procedures

1. Introduce and discuss the following vocabulary words with the students. (Creating a K-W-L Chart if appropriate)

Vocabulary:

Gravity
Cylinder
Magnet/Magnetic
Horizontal/Diagonal/Vertical

K-W-L Chart		
Topic: _____		
What I Know	What I Want to Know	What I Learned

2. Place container of cardboard cylinders in the middle of the children
3. Have children create a pompom drop course by asking them to put the cardboard cylinders on the magnetic wall (or tape the paper towel rolls to the wall) in such a way that a pompom can roll through them. There is no “right” way to do this.
4. Describe position of cardboard cylinders as placing them in the course.
5. Give each child a pompom. Children drop their pompom into a cylinder.
6. As kids test out their design, encourage them to continue to adjust their course and add to it.
7. Discuss the concept of gravity with the children and test their ideas.
8. Have children try different sizes of pompoms in their drop course to see the effect gravity has on each.
9. Children observe and discuss what they noticed.

Questions to ask:

- What happened when you dropped your pompom into the cylinder?
- Did everyone’s pompom come out the same place?
- Did everyone’s’ pompom come out at the same time?
- Why did the pompoms always ends up on the ground.

10. Allow the children to try the experiment again, this time allowing them to change where the cardboard cylinders are.

Additional questions:

- What did you notice when you moved your cardboard cylinders?
- Did it make your pompom come out faster? Slower?

11. Children will come to understand that this is a predictable outcome.
12. Close the activity by asking the children what they think will happen if they put the cylinders straight up and down? Sideways?

The Science behind the experiment: <http://www.ducksters.com/science/gravity.php>

- What is gravity? Gravity is the mysterious force that makes everything fall down towards the Earth. But what is it? It turns out that all objects have gravity. It's just that some objects, like the Earth and the Sun, have a lot more gravity than others. How much gravity an object has depends on how big it is. To be specific, how much mass it has. It also depends on how close you are to the object. The closer you are, the stronger the gravity.
- Why is gravity important? Gravity is very important to our everyday lives. Without Earth's gravity we would fly right off it. We'd all have to be strapped down. If you kicked a ball, it would fly off forever. While it might be fun to try for a few minutes, we certainly couldn't live without gravity. Gravity also is important on a larger scale. It is the Sun's gravity that keeps the Earth in orbit around the Sun. Life on Earth needs the Sun's light and warmth to survive. Gravity helps the Earth to stay just the right distance from the Sun, so it's not too hot or too cold.
- Some helpful websites:
http://www.physics4kids.com/files/motion_gravity.html
<https://sciencing.com/explain-gravity-child-2100456.html>
<https://www.activewild.com/gravity-for-kids/>
http://www.esa.int/esaKIDSen/SEMRWR5DIAE_Earth_0.html

Adaptations

- Have a pompom drop course already in place before the lesson starts. Have them move cardboard cylinders after they have tried the course a few times.
- Model procedure first prior to giving children Pompoms
- Modify activity when children begin to lose interest.
- Use verbal, visual, and physical cues to help children know what to do.

Extensions

- Give simple challenges or a timer to get children to use their critical thinking skills and modify their designs.
- Build 2 pompom drops and have the children race.
- Use different items, such as marbles or bouncy balls, to see how different sizes, weights, and densities of materials change the effect gravity has.
- Designing and engineering their own pompom drop lets kids really dive into the concept of gravity. As they test and rebuild their structures they are developing their problem-solving skills.
- Try using pool noodles instead of cardboard cylinders
- Try other gravity experiments:
<https://teaching2and3yearolds.com/7-fun-preschool-gravity-experiments/>

Checking for Understanding

Children will demonstrate their understanding of the lesson by:

- Using their senses to observe and describe the physics behind the pompoms dropping through the course
- Observing and exploring how changing the position of the cardboard cylinder changes how slowly/quickly the pompom hits the ground
- Comparing and describing outcomes of using varying items to see how different sizes, weights, and densities of materials change the effect gravity has on each.

Related Standards for Four-Year-Olds

- III. Social and Emotional Development
 - A. Self-Regulation
 - b. Life/Adaptive
 - A.b.1. Begins to use materials with increasing care and safety
- IV. Language, Communication, and Emergent Literacy
 - A. Listening and Understanding
 - A.1. Increases knowledge through listening
 - A.2. Follows multi-step directions
 - B. Speaking
 - B.1. Speech is understood by both a familiar and an unfamiliar peer or adult.
 - C. Vocabulary
 - C.1. Shows an understanding of words and their meanings
 - E. Conversation
 - E.3. Uses appropriate language and style for context