Science 8+ | Lesson ID: B109 | Golfing Over the Edge

Facilitation Notes

Engage 5 min.

Ask students what they know about golf. Introduce the story of a mini-golf course opening a new hole with a gadget that can putt the ball.

0 | Goals and Objectives
You can introduce the students to the objective and learning targets of this lesson.

1 | Introduction
Ask students what they know about golf.
- *What equipment do players use?* (Sticks called *clubs* to hit the ball.)
- *What are two main ways that they hit the ball?* (A *putt* is when you hit the ball lightly to knock it into the hole. Players also hit the ball hard to try to make the ball go as far as possible.)

You can differentiate between putts and hard hits.

2 | Context
You can use questions to check students' understanding about mini-golf courses. Build their background knowledge as needed.
- *What do you know about mini-golf courses?*
- *What kind of golf hits do people make there?* (Putts or small hits to try to get the ball into a hole.)
- *How are the holes at a mini-golf course different from each other?* (Often each hole has a theme, like a water feature or bridge. Sometimes there are obstacles to get through or fun features to interact with on the way to the hole.)

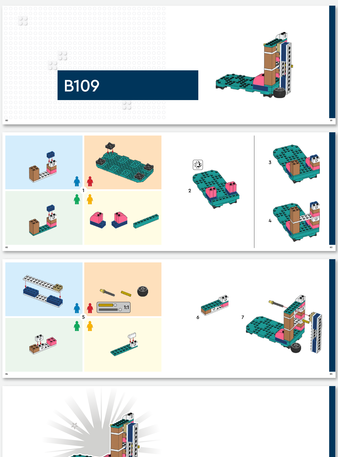
Explore 10 min.

In groups of 4, students will build the golf gadget and a ball. They will explore hitting the ball from different heights.

3 | Groups and Roles
Divide the students into groups of 4. Use the blue, red, green and yellow LEGO® minifigures to assign student roles and help each student find which part of the collaborative model they will build. They can find the corresponding blue, red, green and yellow LEGO minifigure icons in the building instructions.

4 | Build and Explore
Emphasise that students are testing the gadget to see how it works to hit the ball from each height. They need not try to putt the ball into a hole.
If students are ready, they can use these steps to identify patterns in the ball's motion as it is hit from different heights. They should try hitting the ball from each height a few times.
1. *Measure how far the ball goes each time you raise the arm from the first height.*
2. *Record this data on paper or in a notebook.*
3. *Repeat the steps from the second height.*

Building Instruction for use during *Explore*



Explain 5 min.

Students will share the motion patterns they observed when hitting the ball from different heights.

5 | Share
Introduce the key vocabulary *patterns*. You can ask students in year 3 to think more deeply about motion patterns than they did in the lower years.
To check student understanding, you can look and listen for the following:
- Students can describe patterns, such as the ball going a similar distance each time it is hit by the arm from the same height.
- Students notice the pattern that the ball goes further when hit by the arm from a higher height.

Recognising these motion patterns will help students predict future motion.

Elaborate 15 min.

Students will build a hole for the ball and use their observations to predict the motion needed to putt the ball into the hole. Afterwards, they will share their solutions and relate this experience to real-life examples of predictable motion.

6 | Build
You can prompt students to close their box and place the gadget on top at one end. They can then build their hole container and place it on the table right next to the edge of the box at the other end. Students should try to raise the arm of the gadget so it hits the ball hard enough for it to drop easily into the hole without flying over the hole. Introduce the key vocabulary *predict* and encourage students to use their observations from the previous tests to predict how hard the right hit will be.

7 | Share Your Build
Ask your students to explain their results and how they used knowledge from the first test to find the right height. To check student understanding, you can look for the following:
- Students can explain how they used observations from previous tests to predict the right arm height to get the ball to the hole.
- Students can use their model to demonstrate how data collected from the first tests informed their exploration in this test.

8 | In Real Life
Talk with students about ways to use observations to predict future motion.
- *What motion do you think will happen next to the child on the swing? How can you tell?*
- *What happens when you try to connect the same poles on magnets?* (The magnets repel, or push away from each other.)
- *How does seeing the magnets do this help you predict what will happen the next time we try to connect two magnets?* (It shows us to put magnets together with opposite poles facing if we want them to stick to each other.)

Evaluate 5 min.

An optional evaluative prompt asks students to describe one motion pattern they observed with the golf gadget and how they used this to predict future motion.

9 | Show What You Know
Depending on your students' abilities, you can ask them to write short notes in their notebook, draw pictures or use a combination of both.

10 | Clean Up