# **Facilitation Notes**

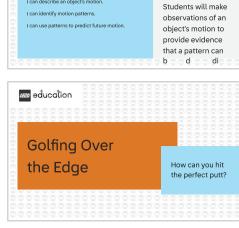
Golfing Over the Edge

## Engage © 5 min.

0

📾 education

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.



### You can introduce the students to the objective and learning targets of this lesson.

**Goals and Objectives** 

## hit the ball)

1 Introduction

What are two main ways that they hit the ball? (A putt is

Ask students what they know about golf.

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

What equipment do players use? (sticks called clubs to

- 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.

## instead of using a club They want to know how well it works. Can you help them test it?

The mini-golf course wants to add a new

challenge! They have an idea for a golf gadget that can hit the ball

## 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.)

model they will build. They can find the corresponding blue, red, green and yellow LEGO minifigure icons in the

Emphasize that students are testing the gadget to see how

it works to hit the ball from each height. They need not try

Explore © 10 min.

hitting the ball from different heights.

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

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

3 Groups and Roles

building instructions.

4 Build and Explore

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

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.

heights. They should try hitting the ball from each height a

Building Instruction for use during Explore



Elaborate © 15 min.

ball all the way to the hole without going too far? Use your previous tests to help

Demonstrate your

ball get into the hole? How did you use what

you learned from your earlier tests to

perfect putt! At what height did the

predict?

you predict<sup>®</sup>.

it from the lowest mark? How far did the ball go

each time it was hit it from the middle and

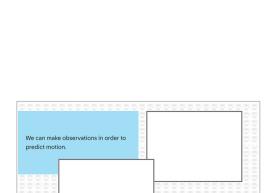
highest mark? Do you notice any

patterns<sup>©</sup>?

6 Build 10:00 Every mini-golf hole needs a You can prompt students to close their box and place the Build a container for the ball to drop into.

Explore using the gadget to hit the ball from different heights.

What kind of hit will move the gadget on top at one end. They can then build their hole



# solutions and relate this experience to real-life examples of predictable

following:

ball to the hole.

in this test.

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

> 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

To check student understanding, you can look for the

used knowledge from the first test to find the right height.

 Students can explain how they used observations from previous tests to predict the right arm height to get the

 Students can use their model to demonstrate how data collected from the first tests informed their exploration

container and place it on the table right next to the edge of

graders to think more deeply about motion patterns than

To check student understanding, you can look and listen for

• Students can describe patterns, such as the ball going

Students notice the pattern that the ball goes farther

when hit by the arm from a higher height.

Recognizing these motion patterns will help students

a similar distance each time it is hit by the arm from the

they did in the younger grades.

the following:

same height.

predict future motion.

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?

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

 What happens when you try to connect the same poles on magnets? (The magnets repel, or push away from

An optional evaluative prompt asks students to describe one motion pattern

Depending on your students' abilities, you can ask them to

write short notes in their notebook, draw pictures or use a

# they observed with the golf gadget and how they used this to predict future

motion.

Describe one pattern

you saw when the

Clean Up

Evaluate © 5 min.

other.)

### golf gadget hit the ball from different heights. How did it help you decide the best way to get the ball into the hole? education

9 Show What You Know

combination of both.

10 | Clean Up

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