

Goal!

Collaborate to build a fun tabletop challenge and score as many goals as possible.



🕒 30–45 min. 📦 Beginner 🎓 Grades 6–8

Teacher Support

Key objectives

Students will:

- Collaborate to solve various challenges
- Collaborate to develop a new challenge

Things you will need

[LEGO® Education SPIKE™ Prime Set](#)

Additional resources

[Building instructions](#)

[Building instructions](#)

[Python Programs](#)

Educational standards

Common Core

CCSS.MATH.CONTENT.6.SP.B.5

Summarize numerical data sets in relation to their context

CCSS.ELA-LITERACY.SL.6.4

Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.6.5

Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

ISTE

7C

Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

Lesson plan

1. Prepare

- Read through the student material in the LEGO® Education SPIKE™ App.
- If you feel it's needed, plan a lesson using the getting started material in the app. This will help familiarize your students with LEGO® Education SPIKE™ Prime.

2. Engage (5 Min.)

- Use the ideas in the *Ignite a Discussion* section below to engage your students in a discussion related to this lesson.
- Use the video to explain the lesson.

3. Explore (10 Min.)

- Have your students work in pairs to build the models for this lesson.
- Encourage them to collaborate as they build.
- Ask them to try out the challenge by playing the program.

4. Explain (10 Min.)

- Challenge each team to score as many goals as possible in one minute.
- If you'd like, have a follow-up discussion about collaboration and what your students have learned so far.

5. Elaborate (15 Min.)

- Challenge each team to create their own challenge.
- Have the teams share their challenges and challenge each other to matches.
- Don't forget to leave some time for cleanup.

6. Evaluate

- Give feedback on each student's performance.
 - You can use the assessment rubrics provided to simplify the process.
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Ignite a Discussion

Start a discussion about collaboration by talking about effective collaborative behaviors. Focus your students' attention on some key elements of successful collaboration. These could be:

- Identifying and agreeing on a common goal
- Clarifying roles within the team
- Being honest about mistakes
- Creating together

To deepen the discussion, talk about the differences between collaboration and teamwork.

- Successful teamwork is based on having a strong leader to guide the team toward a goal. If you've got a strong leader and a clear goal, each team member can work on a distinct part of the project. Direction from the team leader is key to good teamwork.
- Successful collaboration, on the other hand, is based on the team deciding on the

- For successful collaboration, the group has to work together... and think together. The end product comes from the combined efforts of the group. This means that collaborators are equal partners – there is no single leader.

Have your students watch this video to see what they're about to do.

Building Tips

Customizing Different Elements

Here are some ideas your students could use in creating their challenges:

- A. Add a Force Sensor to hit the disk as many times as they want.
 - B. Add a second disk to create more action.
 - C. Use the LEGO bricks to create a point system (e.g., red = 1 point, green = 2 points)
 - D. Use a LEGO Minifigure as the goalkeeper or an obstacle to avoid.
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Coding Tips

Main Program

Differentiation

Take this lesson to the next level by:

- Repeating the lesson in new teams. Make sure to provide feedback to help your students improve their collaboration.
- Incorporating the math or language arts extension(s).

Assessment Opportunities

Teacher Observation Checklist

Create a scale that matches your needs, for example:

1. Partially accomplished
2. Fully accomplished
3. Overachieved

Use the following success criteria to evaluate your students' progress:

- Students collaborated with one another throughout the lesson.
- Students identified specific roles within their team.
- Students solved problems together and used everyone's ideas.

Self-Assessment

Have each student choose the brick that they feel best represents their performance.

- Blue: I've collaborated and scored a lot of goals.
- Yellow: I've collaborated and created an original challenge.
- Violet Brick: I've collaborated to create a challenge using ideas from everyone in our team.

Peer-Assessment

Encourage your students to provide feedback to others by:

- Having one student score the performance of another using the colored brick scale above.
- Asking them to present constructive feedback to each other so that they can improve their group's performance during the next lesson.

Language Arts Extension

To incorporate language arts skills development:

- Ask your students to write down the rules of their challenge.
- Have them use illustrations and graphics to explain the rules.

Note: This will make for a longer lesson.

Math Extension

In this lesson, you'll already be exploring key math concepts, like:

- Have your students graph the direct relationship between the power level of the programming block and the distance traveled by the disk.
- Ask your students to collect data about the number of shots, number of shots on goal, number of goals, and number of successful passes, then generate statistics out of this data.

Note: This will make for a longer lesson.