ACTIVITY SUMMARY

Students will practice *FIRST*® Core Values of communication, teamwork, discovery and innovation while creating a pseudo code to program their team members in completing a job or task.

Age Range & Grade Level: Ages 6 – 10, Grades 2 through 4
Program Connection: FIRST® LEGO® League Explore
Authored By: Jillian Mordarski, Project Manager, FIRST® LEGO® League

ACTIVITY OUTCOMES

Participants will:

1. Demonstrate teamwork and communication skills
2. Discovery basic coding concepts and practice logical thinking
3. Create a new code using the coding blocks provided to complete a task

RELEVANCE MATRIX – Subject Area Crosswalks and Core Values Addressed

Science	Math	Literacy	Social Studies	Computer Science
Movement, Motion	Spatial Reasoning, Shapes	Reading, Listening and Speaking		Coding Basics Pseudo Code
Discovery	Innovation	Impact	Inclusion	Teamwork

FUN! Our last core value should always be used when doing any *FIRST* activities.

KEY VOCABULARY

Communication   Technology   Programming   Pseudo Code

Core Values   Engineering

MATERIALS & SUPPLIES NEEDED FOR THIS ACTIVITY

Speaking Code Student Design Brief

GUIDANCE SET-UP

Description – Action – Guidance	Notes
Provide students with the *FIRST* Speaking Code Design Brief.	The design brief document for students starts on page 4.
Review the problem statement and criteria/constraints with the students. Remind students they will be using the engineering design process and *FIRST* core values to work towards a solution.	Review the age appropriate engineering design process with your students.
Have students watch this short video. Reflect with the students what they learned about how coding is used in machines.	coding and technology
Determine how students will complete the activity, what their length of time will be, how to collaborate and how to share their solutions. Have students work on their solutions.	For distance learning students could do a video or complete this activity over video chat
Have students share their solutions by adding their coding blocks to the game.	Use the reflect questions to allow students to think about their learning
Determine the assessment or grading to be used. See evidence of achievement below.	
Explore the *Go Further!* opportunities	See below
Wrap up – Have students complete their core values self-assessment and review.	

STUDENT OR TEAM ACTIONS

1. Review the problem statement and criteria/constraints.
2. Watch the coding and technology video
3. Reflect on the video using the questions
4. Determine a task and write a code to tell you partner how to complete the task
5. Share your solution and reflect on your learning
6. Explore the Go Further!
7. Complete your *FIRST* core values self-assessment

GO FURTHER!

Create a program using coding blocks and have someone complete a task. You can use the coding blocks you have or add your own.

EVIDENCE OF ACHIEVEMENT

Evaluation Rubric			
Category	**3 points**	**2 points**	**1 point**
Requirements	All requirements on the design brief were met.	Some of the requirements on the design brief were met.	Only a few requirements on the design brief were met.
Design	Clearly showed how the solution would help others.	Showed how the solution would help others.	Not clear how the solution would help others.
Collaboration	Demonstrated collaboration by sharing information or working with team members.	Shared some information or with team members.	Respect and inclusion being developed.
Knowledge Gained	All the questions are answered completely.	All the questions are answered but could have more detail.	The questions are not answered.

FIRST is a global robotics community that prepares young people for the future.

www.firstinspires.org

PROBLEM STATEMENT

Many technologies today like cars, computers, or smart phones need to receive a set of commands to do a job or complete a task. Engineers need to write a code to tell the technology how to complete a specific set of instructions. This takes a lot of communication and teamwork.

To create smart technology, you must learn how to speak and write in this code. In this challenge you will be a coder and your team members are the technology. Write a code to make them do a specific job or task. Remember to use your *FIRST* Core Values!

CRITERIA & CONSTRAINTS

- You must use the set of coding commands provided to help you and others to learn to "speak" code.
- One person is the Coder the other person is the Robot(s). The "Coder" will hold up or say each coding block and have the technology person act out the motion listed for each.
- Say "Coder Says" then hold up or say a coding block. The technology person should act out the step that each block represents.
- Continue reading coding blocks until the task is complete.
- If a task cannot be completed, troubleshoot your code and try again.

ENGINEERING DESIGN PROCESS & *FIRST* CORE VALUES

FIRST Engineering Design Process | Explore *FIRST* Core Values

BUILDING THE BACKGROUND & BRAINSTORMING

Watch this Video on coding and technology

What are some other technologies that use code?

Could you use code to give a person direction to get somewhere or complete a task?

SKETCH YOUR DESIGN

Sketch your ideas for the code, then speak your code to your partner and see if it works.

What task will be attempted with this code?	Write your Code Here
Move Forward ⬆ **Move Backward** ⬇	
Turn Right ➡ **Turn Left** ⬅	
Grab ▲ **Drop** ◆	
Stop ⬟ **Repeat** ↪	

REFLECTION QUESTIONS

1. What did you discover about writing the code?

2. How did you innovate during this activity?

3. Did communication and teamwork affect your success?

GO FURTHER!

Watch this Video on coding and technology:
Now create a new program using your own coding blocks and have someone complete a task. Do more complex movements with less steps.

CORE VALUES SELF-REFLECTION

	Amazing Skill	Great Job	Making Progress	Could Be Better
Discover	I approached the tasks looking for all possible answers independently and used perseverance to discover the answer on my own.	I approached the tasks and asked questions from one other person but persevered to discover the answer on my own.	I approached tasks but needed assistance multiple times to reach a point of discovery.	I depended on others to make the discovery for me.
Innovation	I used creativity and perseverance to solve problems on my own, coming up with unique solutions for the tasks I was given.	I used creativity and perseverance to solve problems on my own coming up with different solutions for the tasks I was given.	I used creativity but struggled with perseverance to solve problems on my own.	I struggled with being creative and only used the information given and needed a lot of encouragement from others to complete the task.
Impact	I approached the tasks applying understanding of the information with the impact it can have on me and my future as well as how I could help others.	I approached the tasks knowing and applying the information with impact it can have on me and my future.	I understand the tasks but struggle to apply how it will help me in my future or to influence others.	I understand the tasks but did not approach it with understanding the impact it can have on my future or others.
Inclusion	I approached all tasks with inclusion of others' ideas, I showed tremendous kindness by including others' views in my projects and work. I approached my solution thinking how all people would interact with the solution.	I approached most with inclusion of others' ideas, I tried to understand others' views and include them in my projects and work. My solution mostly incorporates needs of others.	I approached some tasks with inclusion of others' ideas, I tried to understand others' views and include them in my projects and work. My solution meets only a few needs of others.	I did not approach tasks with inclusion of others' ideas, I tried to understand others' views and include them in my projects and work. My solution is not inclusive of different types of people.
Teamwork	I used collaboration, communication and project management to get all tasks accomplished for myself as well as the others.	I used collaboration, communication and project management to get most tasks accomplished for myself as well as the others.	I used collaboration, communication and project management to get some tasks accomplished for myself as well as the others.	I only sometimes used collaboration, communication and project management and accomplished a few tasks for myself as well as the others.
Fun	I kept a positive attitude throughout and found opportunities to have fun even through struggle. I looked for additional opportunities to have fun in my tasks.	I kept a positive attitude throughout and found opportunities to have fun even through struggle.	I saw the enjoyment and fun after the activity but struggled to see it during.	I only saw struggle in completing my tasks and did not look for times to have fun.