STEM in the lab

Inspiring Idaho's future STEM workforce

TEDDY IS LOST

GRADE LEVELS

This activity is appropriate for students in grades K-12.

MISSION

Use direction arrows to help a "robot" find its lost teddy bear.

VOCABULARY

COMMAND: Directive to a computer program to perform a specific task.

COMPUTER PROGRAMMER: Skilled professional who codes, tests, debugs and maintains computer programs. Computer programmers also conceptualize, design and test logical structures to solve computer issues.

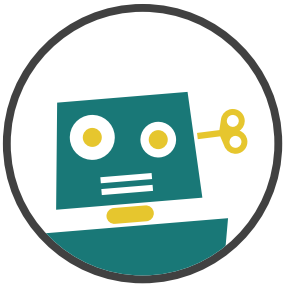
SEQUENCE: Orders that commands are executed by a computer, allows us to carry out tasks that have multiple steps. In programming, sequence is a basic algorithm: a set of logical steps carried out in order.

UNPLUGGED: To teach programming concepts through the use of games or activities that can be done offline using tangible objects, such as paper and markers. Offline coding is a good way to engage younger students without the use of technology.

MATERIALS

- Painter's tape
- Ruler
- Paper
- Teddy bear
- Other stuffed animals

ABOUT THIS ACTIVITY



Computer programmers at INL use code to tell computers what to do. Programmers write instructions, or code, which the computer then executes. Computer programmers solve real-world problems by creating code that will analyze the problem and provide solutions.

When first introducing coding activities to younger students, it is important to start with "unplugged" coding. This means that students are engaged in activities that don't involve working on a computer. Unplugged activities give students the chance to learn the how behind coding before applying it to a computer program.

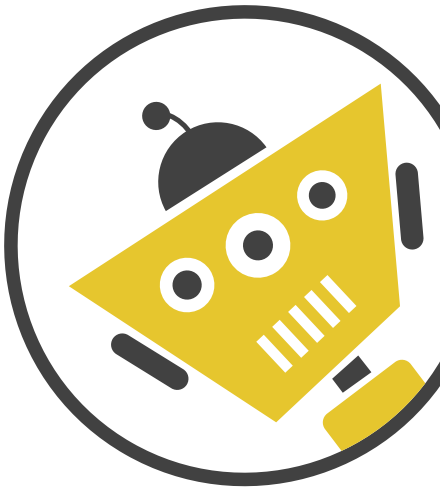
Directional coding is a great activity for younger students. Most students recognize and can follow direction arrows. This activity will involve a "programmer" who will use direction arrows to help a "robot" find its lost teddy bear.

DIRECTIONS

1. Using masking or painter's tape, measure and tape an eight-by-eight grid on the floor. A great size for the squares is 12 inches by 12 inches.

2. Place a teddy bear in one of the squares. Add other stuffed animals to the grid; this will provide a distraction.

3. You will need five pieces of paper. On each piece of paper, write one of the following action steps:
   - » Paper 1: One step forward
   - » Paper 2: One step back
   - » Paper 3: Go right
   - » Paper 4: One step left
   - » Paper 5: Pick up Teddy



4. Using your tape, pick one of the corners and place an X. This will be the starting point.

5. Have one student be the "robot."

6. Another student can be the "programmer." The programmer will use action signs to move the robot through the grid to find the teddy bear. The robot can only move when the programmer gives an action step.

7. The robot stands in the start square. The programmer holds up the different pieces of paper with the action steps. Whatever paper the programmer holds up, the robot will perform that action. The programmer tries to lead the robot to the teddy bear, while avoiding the other stuffed animals that are on the grid.

8. The order that the programmer gives the steps is called the ***sequence***. The action steps that the robot is following are called the ***commands***. Make sure that the programmer and robot both understand these two concepts.

FURTHER EXPLORATIONS

- Add other commands to the action steps.
- Create new symbols for the robot to follow.
- Add more teddy bears to the grid, and time the robot to see how fast he can pick up the teddy bears.
- Complete more unplugged activities: https://inl.gov/inl-initiatives/partnering-with-inl/k-12-stem/resource-library/

RESOURCES

- **Code.org CS Curricula**
  https://curriculum.code.org/
- **"How to Code a Sandcastle," by Josh Funk**
  Available on Amazon

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For information on grants, training and student opportunities, curriculum ideas, and other resources, please visit ***stem.inl.gov.***