# Coding Mouse Exploration

**Home Connection**

Dear Family,
During the past few days, the children used a code to program a robot mouse. They acted just like computer engineers! They . . .

- identified and learned about a problem
- planned ways to solve the problem
- made and tested a model
- revised their design to make it even better

In this exploration, children developed an understanding of the needs of a pet animal. They also learned about the engineering design process and practiced skills such as using and writing a simple computer code, correcting errors in a computer code, making claims based on evidence, and communicating information.

**Say:** *Tell me about what you did in this engineering project.* Ask prompting questions if your child needs help.

- *What was the problem you were solving?*
- *What were the goals that your code had to meet?*
- *What rules did you have to follow?*
- *How did you know your code was successful?*
- *How did you improve your plan?*

On the back of this sheet, work with your child to extend his or her work in the challenge.

# Coding Mouse Exploration

**Home Connection**

## About Animal Needs

Pet mice are animals that need certain things to live and grow. These basic needs include air to breathe, clean water to drink, the correct kinds of food to eat, and a safe and dry place to live. Ask your child to describe some of the different things that a mouse needs to live. Prompt your child, if needed:

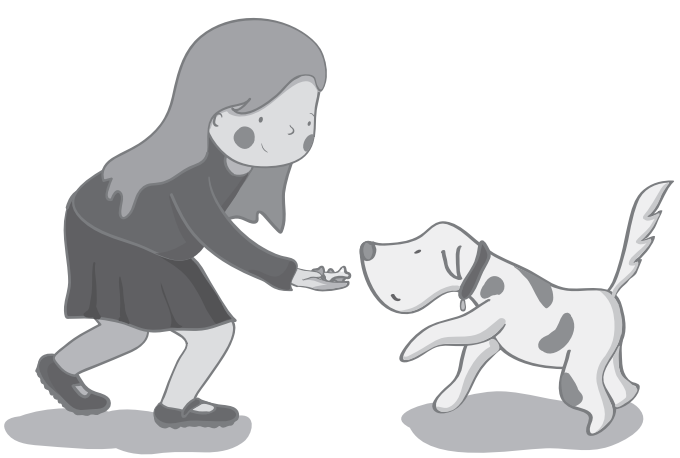
- *What kinds of food does a mouse need to eat?*
- *What kinds of food are not good for a mouse?*
- *What kind of shelter does a mouse need?*
- *What are some things that can be dangerous to a pet mouse?*

## Try It!

All animals have certain needs. If a family has a pet, the family is responsible for meeting those needs.

If your family has a pet, discuss some of the things that your pet needs. Walk around your home and have your child point out how you provide the pet with the things it needs. For example, have the child identify the shelter the pet needs (such as a cage or a house), the kinds of foods that the animal eats, and how the animal gets water. Have your child draw a picture showing all the things that your pet needs.

If you do not have a pet, you may observe birds at a bird feeder or animals in a park, such as ducks in a pond. Also consider visiting an animal shelter or a pet store with your child so that your child can talk with someone about how to care for pets.



# Mouse Movement

Name _____

**Use a mouse token.**

**Follow the code on page 9 of your book.**

Each square stands for one green grid square.

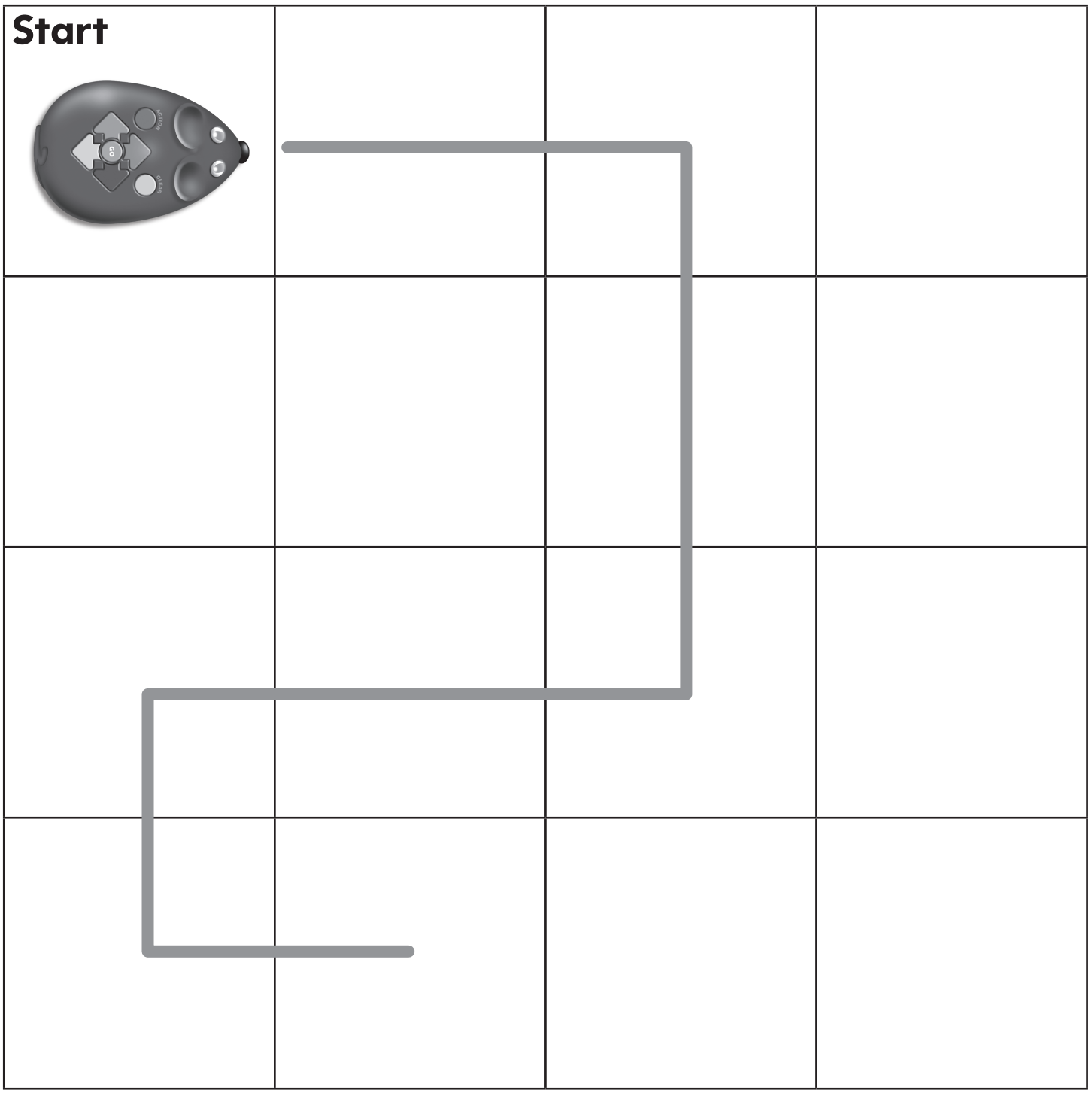
| | | | |
|---|---|---|---|
|  | | | |
| | | | |
| | | | |
| | | | |

**Observe** Look at the squares you colored in.

What letter do they make?_____

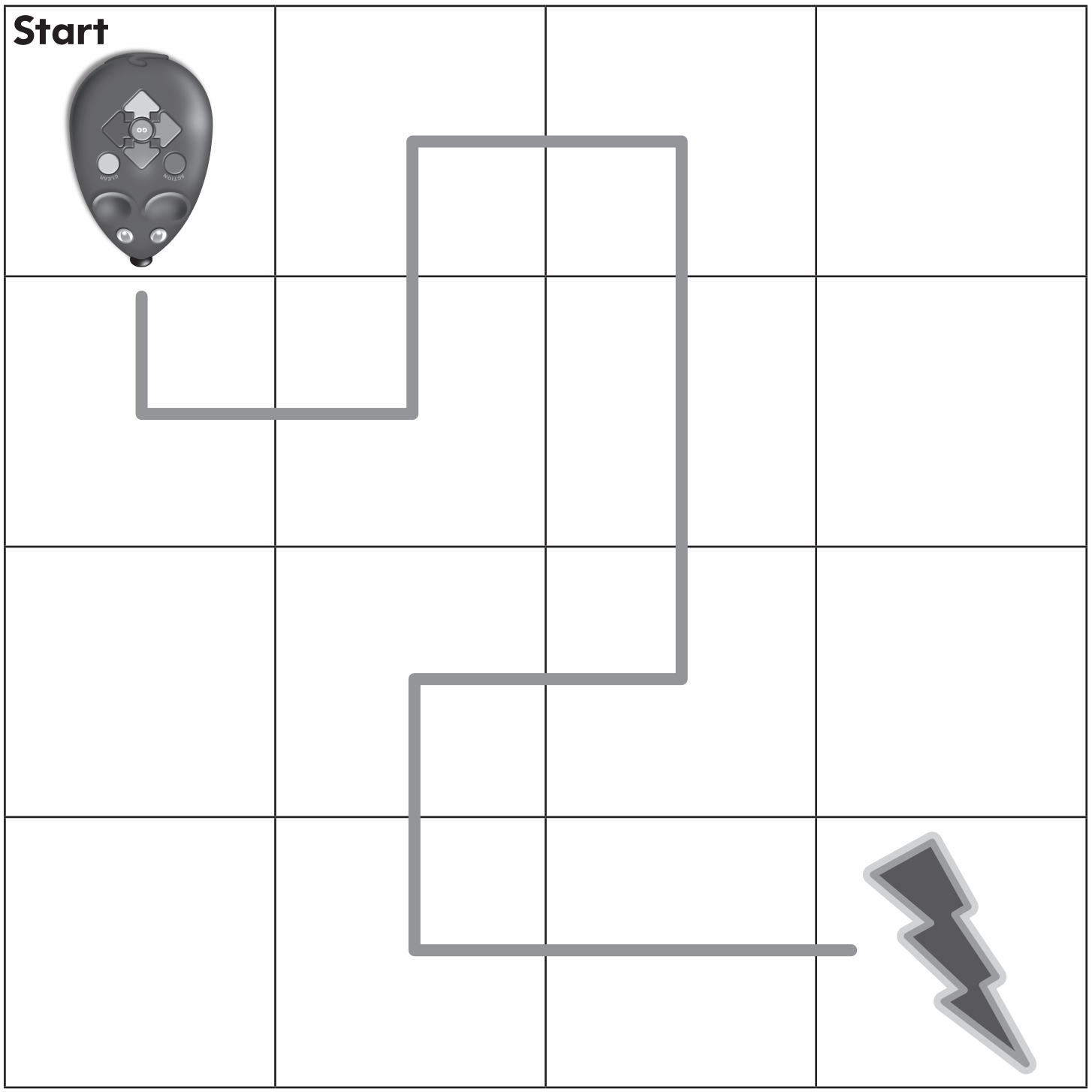
# Mouse Path A

Name _____



# Mouse Path B

Name _____



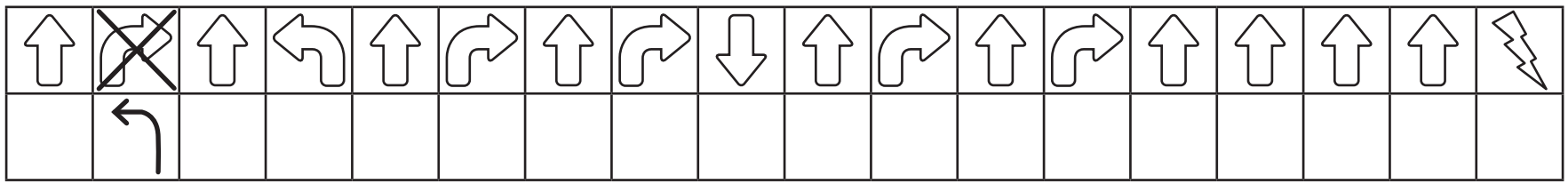
Name _____

# Debug a Code

**Follow these steps.**

1. Color the code below to match Jack's buttons.
2. Compare **Mouse Path B** to this code.
3. Put an X on the mistakes in the code.
4. **Debug** Write the correct code below each mistake.

| | | | | |
|---|---|---|---|---|
| Blue | Yellow | Purple | Orange | Red |

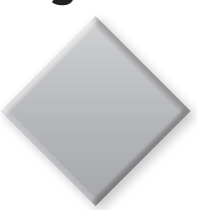
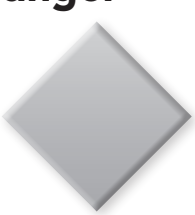
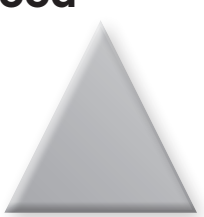


# Shelter Plan

Name _____

**Follow these steps. Show that Jack can get what he needs.**

1. **Imagine** Draw the path for Jack.
   End at the mouse bed.
2. **Plan** Show where you will put the purple walls to make tunnels.
3. Watch out for danger!

| | | | |
|---|---|---|---|
| **Start** | | | **Danger**  |
| | | **Mouse Bed**  | |
| **Danger**  | | | **Food**  |
| | **Water**  | | |

Name _____

# Code Plan

## Follow these steps.

1. **Plan** Use coding cards to plan a code that matches your **Shelter Plan**.
2. **Program** Have Jack do an action at the end of the code.
3. **Record** Write your code in the boxes below.

# Reflect On It

Name _____

**Think about your test results. Answer these questions.**

1. Our design met these goals:

- ☐ Get food and water.
- ☐ Go to the mouse bed last and do an action.
- ☐ Stay away from danger.

2. Our design followed these rules:

- ☐ Had 20 or less steps.
- ☐ Had 16 or less purple walls.
- ☐ Had 4 or less walls around any "danger" square.

3. Our plan was successful because _____

_____

4. How many steps did your code use? _____ Could your team have used fewer steps? _____

_____

5. Did the tunnels help Jack get to food, water, and his mouse bed? _____

_____

6. How will you change your code? Tell why. _____

_____

_____

_____

_____

# Rubric for Coding Mouse Exploration

Team Members: _____ Date: _____

| Team activity | 1 – Unsatisfactory | 2 – Proficient | 3 – Advanced | Scoring & Comments |
|---|---|---|---|---|
| *Explore How to Write and Debug Codes* | ☐ Few team members participate in the coding activities.<br>☐ Many coding activities are done incorrectly. | ☐ Most team members participate in the coding activities.<br>☐ Most coding activities are done correctly. | ☐ All team members participate in the coding activities.<br>☐ All of the coding activities are done correctly. | |
| *Make a Team Plan for Jack's Path* | ☐ Few team members give ideas for the plan.<br>☐ Plan does not consider the goals of the problem. | ☐ Most team members give ideas for the plan.<br>☐ Plan considers most of the goals of the problem. | ☐ All team members give ideas for the plan.<br>☐ Plan considers all of the goals of the problem. | |
| *Write a Code Based on a Plan* | ☐ Code does not match the plan; no problems are debugged before testing.<br>☐ Code does not follow the rules of the problem. | ☐ Code matches most of the plan; some problems are debugged before testing.<br>☐ Code follows some rules of the problem. | ☐ Code matches the plan; most problems are debugged before testing.<br>☐ Code follows all of the rules of the problem. | |
| *Make Claims Based on Evidence* | ☐ No claims are supported by evidence.<br>☐ No claims are stated clearly. | ☐ Most claims are supported by evidence.<br>☐ Most claims are stated clearly. | ☐ All claims are supported by evidence.<br>☐ All claims are stated clearly. | |
| *Revise the Plan and Code* | ☐ Revised plan does not use test results or feedback from the other teams.<br>☐ Revisions do not make the code more successful in meeting the goals. | ☐ Revised plan uses some test results and feedback from the other teams.<br>☐ Revisions make the code somewhat more effective in meeting the goals. | ☐ Revised plan uses the test results and feedback from the other teams.<br>☐ Revisions make the code more effective in meeting the goals. | |

Team Score: _____

# STEM Action

Grades K–2


**Wild Feet Exploration** 79631

Students explore the connection between nature and the human-made world by designing hiking shoes that use nature for inspiration.


**Shrinking Shore Exploration** 79812

Children explore the power of ocean waves and come up with a model to protect the beach from erosion.


**Sound Bite Exploration** 79811

Jazmin wants to tell Amit about soccer tryouts, but Jazmin and Amit don't have a way to communicate quickly. Students learn about sound waves and vibrations to develop a working prototype phone to help these friends talk over a distance.

## STEM in Action™ modules align with these branches of science:

| | Life | Earth | Physical |
|---|---|---|---|
| **PreK–K** | Ron's Habitat Adventure **79849** | Pam and Ava's Mapping Adventure **79660**<br>Gus and Nia's Shaking Adventure **79670**<br>Little Footprint Exploration **79820** | Ron's Ramp Adventure **79610**<br>Pam's Camping Adventure **79650**<br>Sunny Sandbox Exploration **79630**<br>Sidewalk Safety Exploration **79810** |
| **1–2** | Wild Feet Exploration **79631**<br>Seed Rescue Exploration **79822**<br>Coding Mouse Exploration **86168*** | Shrinking Shore Exploration **79812** | Shadow Box Theater Exploration **79821**<br>Sound Bite Exploration **79811**<br>Muddy Mats Exploration **79632** |
| **3–5** | Wildlife Corridors Challenge **79823**<br>Food Deserts Challenge **79815** | Farmer Grady's Challenge **79613**<br>Earthquake Technologies Challenge **79814**<br>Rainwater Runoff Challenge **79825** | Squeaky Clean Magnets Challenge **79813**<br>Digital Relay Challenge **79824**<br>Solar House Design Challenge **79614**<br>The Great Toy Design Challenge **79615** |

*For grades K–2.

For more information, visit **hand2mind.com/steminaction**

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