

Smart Buddies™

teaching everyone to code



Coding Program Parent Guide

PITSCO
EDUCATION

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Welcome to Smart Buddies™!

We're excited that you and your child have chosen Smart Buddies™ to start or to continue your coding adventure. We're on a mission to help children identify with STEM concepts, and we're so excited you're coming along for the ride! Smart Buddies includes one self-balancing, programmable scooter called a Siggy; one character; and access to the Smart Buddies app. The instructions to follow, along with the app, will guide you through several block-based coding activities, covering concepts such as sequencing, functions, subroutines, and loops.

This guide is meant as an aid to parents, even those not familiar with coding, to help their child learn the basics of coding in three simple steps, all while having fun!

Step 1: Understand the basic concept of coding

Step 2: Learn about commands and sequences key to coding

Step 3: Practice what you have learned

Let's get started!



If you can see it, you can be it!

Activity 1: Introduction to Smart Buddies and Pseudocode

Learning Objectives

By the end of this activity, your child will:

- Examine the activity options within the Smart Buddies app and demonstrate the ability to navigate the Smart Buddies app.
- Write pseudocode and explain its importance.
- Pair a Siggie and a Smart Buddy to a device and control it using the Free Play and/or Path activities.

Materials

Task 1: Intro to the Smart Buddies app

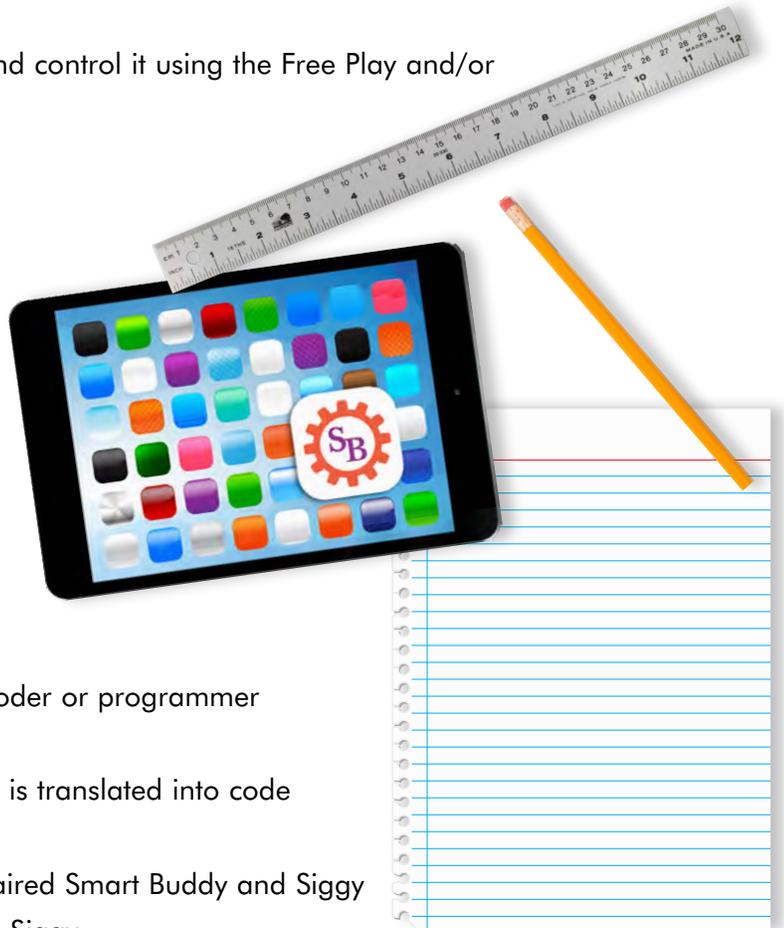
- Device with Smart Buddies app installed

Task 2: Pseudocode

- Paper
- Pencil
- Ruler

Task 3: Free Play and Path

- Device with Smart Buddies app installed
- Smart Buddy and Siggie



Smart Buddies Lingo

code: the commands or instructions created by a coder or programmer

function: a saved set of movements

pseudocode: a set of step-by-step instructions that is translated into code

Siggie: a two-wheeled vehicle for Smart Buddies

Smart Buddies app: the app used to control a paired Smart Buddy and Siggie

Smart Buddy: a character created for use with the Siggie

Test Mode: a place in the app where you can virtually watch your code before you try it with your Smart Buddy

variable: something that can take on a different value, can vary, or is changeable

Task 1

1. Download the Smart Buddies app. Refer to the card inside the box for details on how and where to download and then introduce your child to the app. The Smart Buddy and Siggie are not needed for this activity.

2. Select **Choose Activity** on the main screen and explore and explain the activities (E-books, Free Play, Path, Learn, Sandbox, and Missions).
 - **E-books:** Each Smart Buddy has a unique story written at two reading levels: Primary (K-3) and Intermediate (4-6). Swipe right or left in the app to see more e-books.
 - **Free Play:** This turns the device into a remote control and allows children to control their Smart Buddy using the buttons shown. Check out this video for reference: <https://video.pitsco.com/default.aspx?vID=853>.
 - **Path:** Children can draw a path for their Smart Buddy to follow.
 - **Learn:** Tutorials in this activity enable children to code using drag-and-drop block-based coding.
 - **Sandbox:** This is an area for open coding using blocks. Your child can also test his or her code using a simulation prior to sending the code to the Siggy.
 - **Missions:** These activities enable children to test out their coding skills with a predetermined Mission. Difficulty level is indicated with a number of highlighted stars.



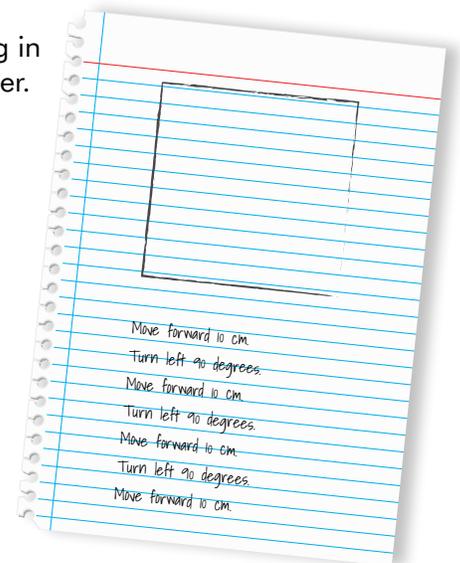
Watch the Smart Buddies Free Play video

Questions to Think About

- What activities did you see while exploring the app?
- What are you most excited to do with your Smart Buddy?

Task 2

1. Children will need a piece of paper, a pencil, and a ruler.
2. Ask your child the following questions and have him or her reflect on the answers.
 - What does coding mean to you?
 - Have you coded anything before?
 - If so, what did you code?
3. Summarize the discussion by defining *coding* as giving a computer or robot a command to follow. Each set of commands or instructions is called code.
4. Remind your child that he or she is using pseudocode prior to coding in the app, so the instructions need to be precise and in the correct order.
5. Have your child draw a square on the paper using the same length in centimeters (cm) on all sides. Have him or her write down all instructions for the Smart Buddy, being as detailed as possible. Instructions should look something like the following:
 - Move forward 10 cm.
 - Turn left 90 degrees.
 - Move forward 10 cm.
 - Turn left 90 degrees.
 - Move forward 10 cm.
 - Turn left 90 degrees.
 - Move forward 10 cm.



- The specific distance is considered a variable. Explain to your child how to change the distance variable from 10 cm to 5 cm. Explain how this will affect the pseudocode.

Questions to Think About

- What is pseudocode?
- Why are measurements important when coding?
- What else could be considered a variable in pseudocode?



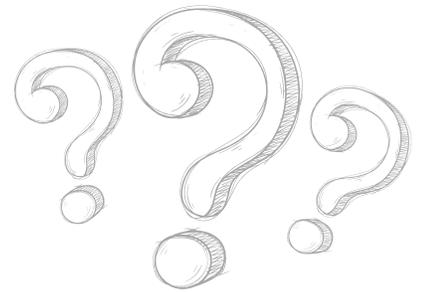
How to pair the Siggys with the app

Task 3

- Pair the Siggys with the app. Check out this video for reference: <https://video.pitsco.com/default.aspx?vID=851>.
- Turn on the Siggys using the on/off switch on the bottom of the Siggys. Make sure the Smart Buddy is securely attached to the Siggys by the wrist clips. Open the Smart Buddies app on your device. Select your Siggys.
- Place the Smart Buddy on the floor so it can balance itself. The Smart Buddy will move back and forth when it is balanced. A green outline will appear around the Siggys on the screen when it is synced with the app.
- Try out the features in Free Play and Path.

Questions to Think About

- Which do you prefer, using a remote control or drawing your Smart Buddy's path?
- What do you think of Test Mode? Do you think it will come in handy in the future?



Parent Notes



Activity 2: Tutorials

Learning Objectives

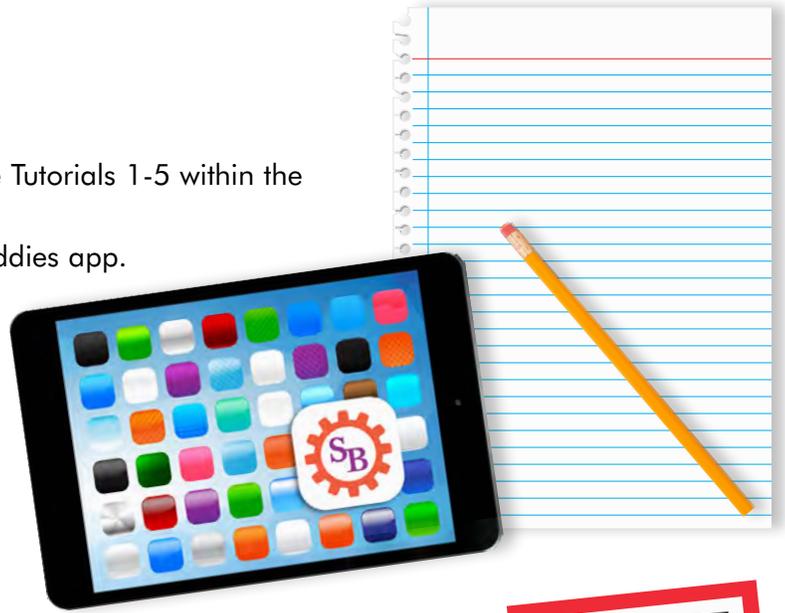
By the end of this activity, your child will:

- Create and translate pseudocode to complete Tutorials 1-5 within the Smart Buddies app.
- Complete all 10 tutorials within the Smart Buddies app.

Materials

Tasks 1 and 2: Tutorials

- Device with Smart Buddies app installed
- Smart Buddy and Siggy
- Paper
- Pencil



Smart Buddies Lingo

- **coding block:** a block within the Smart Buddies app that has been coded for the Smart Buddy to perform a certain function
- **syntax:** the written version of code
- **tutorial:** a practice session that teaches you how to do something such as how to code



Learn about the Smart Buddies tutorials

Task 1

If your child doesn't remember how to pair their Siggy, you can review this process.

1. When you're ready to start, select **Choose Activity** and then **Learn**.
 - Check out this video for reference: <https://video.pitsco.com/default.aspx?vID=854>.
2. After your child enters the Learn screen, the directions will show up first. It is recommended that your child take notes as he or she works through the tutorials. Have your child write down the variables so he or she doesn't have to go back and forth between the directions and the workspace.
3. After reading the directions, your child should create the code suggested. To do this, have him or her drag the available blocks on the left into the white workspace. The blocks should connect like puzzle pieces.
4. To see the text-based coding language, choose **Show code** at the top of the screen.
5. When your child thinks the code is correct, choose **Show on screen**. This will play an on-screen simulation of the buddy and then the code created. Then, to watch the Smart Buddy execute the code, choose **Drive on floor**.
6. If your child needs to go back to look at directions again, he or she can select the question mark icon located in the lower-left corner. If he or she is creating code and uses the go back button, it will exit the tutorial and work will be lost.
7. Please note, programs created in the tutorial cannot be saved!



8. Select **Show on screen** (Test Mode) to gain feedback on whether the code was created correctly. If it was not, your child will get a hint at what to check and two more chances to create the correct code on his or her own. On the third attempt, if it is still incorrect, he or she will get the option to look at what the correct code should be.
9. When all blocks that are needed for the code have been used, the block on the side of the screen will turn gray.
10. Degrees are shown in a circle format. You might want to review what 90, 180, 270, and 360 degrees look like on a circle.

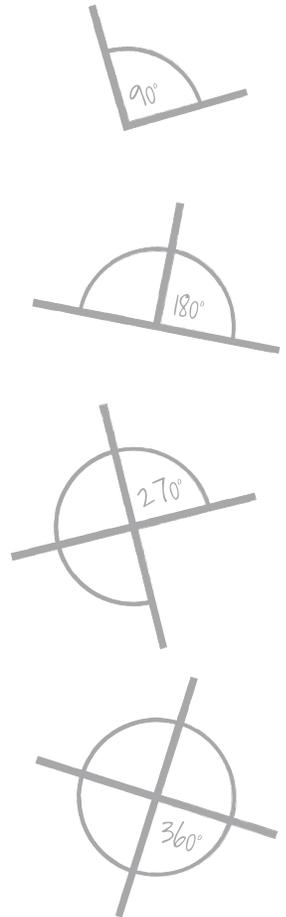
Questions to Think About

- Why is it important to jot down the variables?
- How is this like pseudocode?
- What do you notice about the written code?
- How are the written code and block code the same? How are they different?
- How many tries did it take for you to get the correct code?
- What have you learned so far in the tutorials?
 - Students should have covered the following topics:
 - Moving the Siggy forward or backward
 - Changing speed
 - Turning at different degrees
 - Turning with a radius

Task 2

1. Your child should now complete Tutorials 6-10 in the Smart Buddies app.
 - In Tutorials 8 and 9, Test Mode will not show your child what he or she needs to see because the Smart Buddy/Siggy is not facing the correct direction. Your child will need to use the actual Smart Buddy and Siggy for this test.
 - The code created needs to follow the directions exactly to get positive feedback. If the coding blocks have the correct variables but are not in the right order, they will not be counted as correct.
 - The tutorials will not cover all the blocks that are available in the Sandbox open-coding activity.
2. After your child can explain what he or she has coded, he or she can move on to the next activity.

Note: The obstacle needs to be placed close to the ground so that the ultrasonic sensor at the bottom of the Siggy can recognize the object.



Activity 3: Shapes

Learning Objectives

By the end of this activity, your child will:

- Code a path around a square.
- Code a path around a triangle.
- Use the loop function.

Materials

Task 1: Creating Shapes

- Device with Smart Buddies app installed
- Smart Buddy and Siggy
- Paper
- Pencil
- Scissors
- Painter's tape (optional)

Task 2: Coding Shapes

- Device with Smart Buddies app installed
- Smart Buddy and Siggy

Smart Buddies Lingo

- **loop:** a sequence of instruction that is continually repeated until a certain condition is reached

Task 1

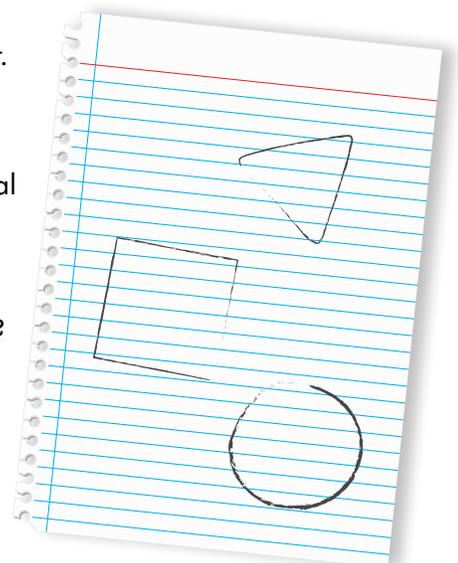
1. Have your child draw the shapes on paper and cut them out. After the shapes are drawn and cut, tape them to the floor and have your child write pseudocode so the Siggy will move around the shape.
2. If you prefer, you can use painter's tape to create the shapes on the floor.
3. Have your child code in the Sandbox and finalize his or her code for moving around each shape.
4. What other shapes can be made? Have your child create a few additional shapes and code for those.

Questions to Think About

- What was most challenging about moving your Siggy around each shape?
- Do you think it would be difficult to move around a circle?

Task 2

1. After your child has mastered the code to move around each shape, have him or her use the loop function to move around each shape two times, then three times, and then four times.



Activity 4: Get a Hot Dog Mission

Learning Objectives

By the end of this activity, your child will:

- Assess the Mission map and legend to determine the requirements for completing the Mission.
- Write and translate pseudocode to complete the Mission.

Materials

Tasks 1-2: Create Pseudocode and Code Your Path

- Device with Smart Buddies app installed
- Smart Buddy and Siggy
- Paper
- Pencil

Smart Buddies Lingo

- **Mission:** a challenge within Smart Buddies aimed at helping students with problem-solving and collaboration; each Mission has a story tied to it

Task 1

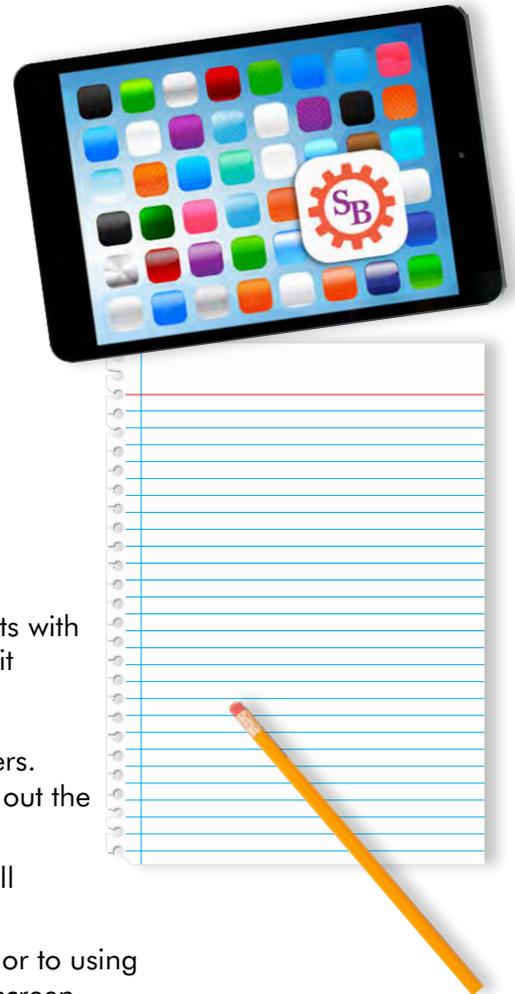
1. The Hot Dog Mission incorporates some measurement in centimeters. Make sure you have enough space so that your child can measure out the path the Smart Buddy will take.
2. Have your child watch the short video for the Mission. The video will explain the activity and challenge.
3. Your child should jot down the specific variables as pseudocode prior to using the coding blocks since the Mission instructions do not stay on the screen.
4. You might want to have your child begin writing down pseudocode.
 - For example, walk forward 65 cm, pause 4 seconds. This should get him or her to the first hot dog stand.
5. Having your child write the code from top to bottom will help him or her to see which coding blocks will be needed.

Questions to Think About

- How is pseudocode helpful?
- What information did the video provide? Was it helpful?

Task 2

1. At this point, your child should finalize the code on paper and begin coding in the Smart Buddies app.
2. It might be a good idea to break the Mission into chunks to help your child during troubleshooting. For example, in this Mission, you could have him or her work on just the code to get to the first hot dog stand. When the Smart Buddy gets to that one, have your child add on the code for the second stand and so on. As long as your child does not select the go back button, his or her work should remain in the workspace. Work can also be saved by selecting the save button. Your child's work will be available only on the device it is saved on and cannot be accessed from other devices.



Activity 5: Create Your Own Challenge

Learning Objectives

By the end of this activity, your child will:

- Write his or her own story and challenge involving moving the buddy from Point A to Point B.
- Outline the pseudocode that will get a buddy on a path from Point A to Point B and back.
- Create the code for the route.
- Test the codes and make adjustments as needed.

Materials

Tasks 1-4: Create Your Own Challenge

- Device with Smart Buddies app installed
- Smart Buddy and Siggy
- Paper
- Pencil

Task 1

1. Have your child write his or her own story and challenge to code, similar to the Hot Dog Mission. Be creative!

Task 2

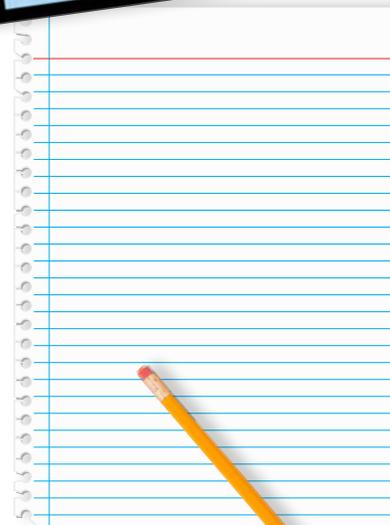
1. Use the Sandbox activity in the app to create code for the challenge. Encourage your child to review the tutorials if necessary as he or she begins to code.

Task 3

1. Help your child outline the pseudocode for the obstacle course.

Task 4

1. Your child should finalize the pseudocode and code for the obstacle course and then test to make sure it will work. After he or she is certain it will work, give it a whirl!





More than coding

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