PUZzlets™
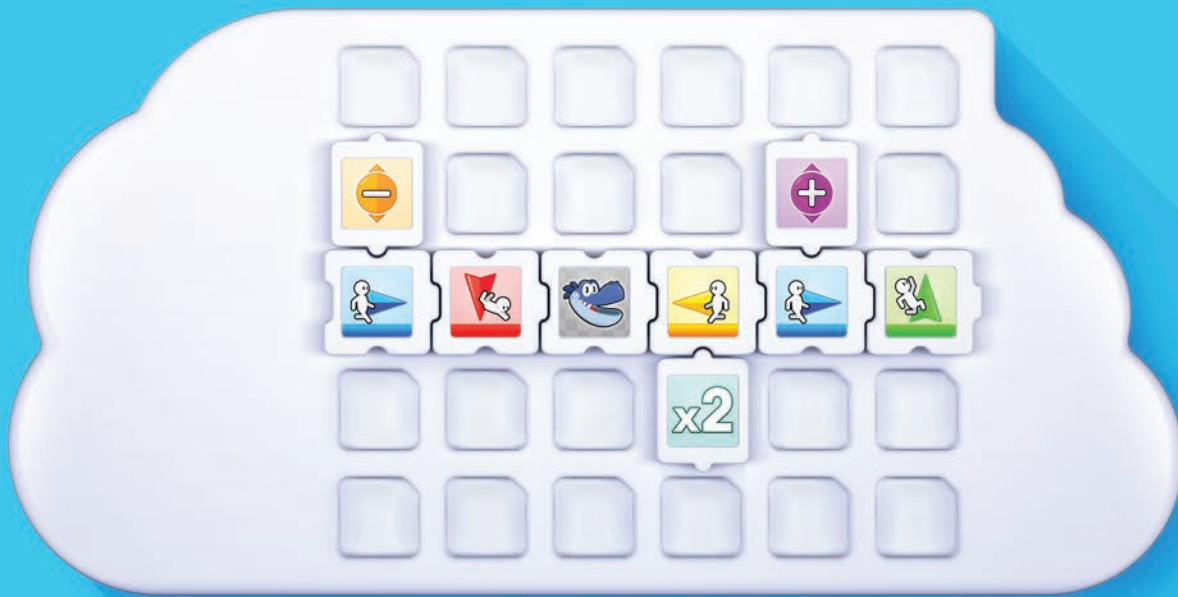
Curriculum

CURRICULUM OVERVIEW

This course is designed to build students' persistence, collaboration and sequential thinking. Using character, command, and modifier Puzzlets, students will:

1. **Plan -** stop and think about how to get the Rus, Hippo, or Sydney to the puzzle piece. Each level presents a new set of challenges.

2. **Program -** creatively place Puzzlets in the Play Tray. Millions of possible Puzzlets combinations allow you to come up with multiple solutions to one puzzle.

3. **Play -** using a strategic thought process and timing, move through the levels by tapping or clicking to reach each goal.

LESSON SEQUENCE

This course is broken into six (6), 40-60 minute sessions and includes both whole group instruction and small group work.

Lesson #1 Get the Golden Puzzle Piece
Students work with algorithms to move Rus through a maze to get the puzzle piece. They will then work together to write a program to direct the teacher through a nice (9) block maze.

Lesson #2 Collaboration with Cork the Volcano
Students will be introduced to the concept of working together and will learn how to log into the game to begin play.

Lesson #3 Playing Cork the Volcano*
In this lesson, students will work together to solve the Cork the Volcano puzzles.

Lesson #4 Persisting at Puzzles*
In this lesson, students will continue to work together to solve the Cork the Volcano puzzles.

Lesson #5 Debug Rus
Students will be introduced to the concept of debugging and practice debugging programs.

Lesson #6 Loop It
Students will be introduced to the concept of looping and practice looping programs.

*** Lessons may be repeated multiple weeks.**

ISTE Standards Connected

MAPPED TO ISTE STANDARDS

The standards listed below are standards from the International Society for Technology in Education (ISTE)'s Framework which map to learning opportunities with Cork The Volcano and Puzzlets.

CREATIVITY AND INNOVATION

Students demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology.

    a. Apply existing knowledge to generate new ideas, products and processes
    b. Create original works as a means of personal or group expression
    c. Identify trends and forecast possibilities

While playing Puzzlets a child is constantly using their creativity and innovative thinking. They use knowledge they've constructed through the game to continue to build on more difficult tasks. As the levels progress the sequences needed become more complex. Students use the prior knowledge they have built through past levels to identify trends and make decisions based off of these possibilities. Additionally, as they are coming up with the solution to these problems they are creating original designs because their are multiple ways to advance through each level.

CRITICAL THINKING, PROBLEM SOLVING AND DECISION MAKING

Students use critical thinking skills to plans and conduct research, manage projects, solve problems and make informed decisions using appropriate digital tools and resources.

    a. Identify and define authentic problems and significant questions for investigation
    b. Plan and manage activities to develop a solution or complete a project
    c. Use multiple processes and diverse perspectives to explore alternative solutions

While playing Puzzlets a child is identifying problems and thinking critically to make decisions and find a viable solution to these problems. They communicate with their partner and they discuss the best solution to advance through the game play. Students are forced to design a sequenced solution to advancing through the game before they can even play through the level. This game play requirement, formed by the Play Tray and app interaction, creates a challenge where students are required to think critically and organized possible solutions before trying to advance through the game. If they only put down a few steps they will soon realize they must design their entire sequence of instructions before they can start in order to advance.

Learn more about ISTE Standards, visit bit.ly/puzzlets-iste-standards

Common Core Standards Connected

MAPPED TO COMMON CORE STANDARDS

The standards listed below are standards from the Common Core Framework which map to learning opportunities with Cork The Volcano and Puzzlets.

Kindergarten

READING FOUNDATIONAL SKILLS

CCSS.ELA-LITERACY.RF.K.1.A
Follow words from left to right, top to bottom, and page by page.

When Kindergarten students play Puzzlets they are working with directional arrows (left, right, up/jump, down/stop) to get their characters through a level. They have to sequence their directions on our Play Tray from top to bottom and left to right. These new concepts are reinforced through our game-play.

SPEAKING AND LISTENING (Comprehension and Collaboration)

CCSS.ELA-LITERACY.SL.K.1
Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.SL.K.1.A
Follow agreed-upon rules for discussions

CCSS.ELA-LITERACY.SL.K.1.B
Continue a conversation through multiple exchanges.

Kindergarten students improve their cooperation and communication skills as they work with a partner to play Puzzlets. Since each partner has a defined job they are able to concentrate on improving their ability to explain their thoughts and reasoning to their partner. Students are encouraged to discuss their reasoning with their partner and to be open to the other's ideas.

MATHEMATICS (Operations and Algebraic Thinking)

CCSS.MATH.CONTENT.K.OA.A.1
Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

Kindergarten students are introduced to basic algorithmic expressions as they design a sequence to advance through a level.

Common Core Standards Connected

1st Grade

SPEAKING AND LISTENING (Comprehension and Collaboration)

CCSS.ELA-LITERACY.SL.1.1
Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.SL.1.1.A
Follow agreed-upon rules for discussions.

CCSS.ELA-LITERACY.SL.1.1.B
Build on others' talk in conversations by responding to the comments of others through multiple exchanges.

CCSS.ELA-LITERACY.SL.1.1.C
Ask questions to clear up any confusion about the topics and texts under discussion.

1st grade students improve their cooperation and communication skills as they work with a partner to play Puzzlets. Since each partner has a defined job they are able to concentrate on improving their ability to explain their thoughts and reasoning to their partner. Students are encouraged to discuss their reasoning with their partner and ask questions about their partner's sequences.

2nd Grade

SPEAKING AND LISTENING (Comprehension and Collaboration)

CCSS.ELA-LITERACY.SL.2.1
Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.SL.2.1.A
Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).

CCSS.ELA-LITERACY.SL.2.1.B
Build on others' talk in conversations by linking their comments to the remarks of others.

2nd grade students improve their communication skills as they work with a partner to play Puzzlets. Since each partner has a defined job they are able to concentrate on improving their ability to explain their thoughts and reasoning to their partner. Students are encouraged to discuss their reasoning with their partner and ask questions about their partner's sequences. Then make decisions based off of what idea they determine is best to advance.

Common Core Standards Connected

3rd Grade

INTEGRATION OF KNOWLEDGE AND IDEAS

CCSS.ELA-LITERACY.RI.3.8
Describe the logical connection between particular sentences and paragraphs in a text (e.g. cause/effect, first/second/third in a sequence).

3rd grade students improve their ability to logically sequence events as they play Puzzlets. By teaching the characters the best way to advance with the use of growingly complex sequences our students gain a greater understanding of cause and effect as well as ordering events in a sequence.

4th Grade

INTEGRATION OF KNOWLEDGE AND IDEAS

CCSS.ELA-LITERACY.RI.4.5
Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

4th grade students improve their ability to describe a sequence events as they play Puzzlets. By teaching the characters the best way to advance with the use of growingly complex sequences our students gain a greater understanding of problem/solution, cause and effect as well as chronologically ordering events in a sequence and comparing why varying methods would work better.

5th Grade

INTEGRATION OF KNOWLEDGE AND IDEAS

CCSS.ELA-LITERACY.RI.5.5
Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.

5th grade students improve their ability to compare and contrast a sequence events as they play Puzzlets. By teaching the characters the best way to advance with the use of growingly complex sequences our students gain a greater understanding of why varying methods sequencing steps would work better depending on the requirements of the level and benefits of each technique.

Common Core: Standards for Mathematical Practice
The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education.

Common Core Standards Connected

While Playing Puzzlets students are exposed to each area of the Standards for Mathematical practice, giving them the basic understanding and framework required to develop mathematical expertise.

Standards for Mathematical Practice*	Aligned
CCSS.MATH.PRACTICE.MP1 Make sense of problems and persevere in solving them.	×
CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively.	×
CCSS.MATH.PRACTICE.MP3 Construct viable arguments and critique the reasoning of others.	×
CCSS.MATH.PRACTICE.MP4 Model with mathematics.	×
CCSS.MATH.PRACTICE.MP5 Use appropriate tools strategically.	×
CCSS.MATH.PRACTICE.MP6 Attend to precision.	×
CCSS.MATH.PRACTICE.MP7 Look for and make use of structure.	×
CCSS.MATH.PRACTICE.MP8 Look for and express regularity in repeated reasoning.	×

* Source: www.corestandards.org/math/practice

MAPPED TO P21 STANDARDS

The standards listed below are standards from the P21 Framework which map to learning opportunities with Cork The Volcano and Puzzlets.

LEARNING AND INNOVATION SKILLS

Learning and innovation skills increasingly are being recognized as those that separate students who are prepared for a more and more complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future.

CREATIVITY AND INNOVATION

Think Creatively
    a. Use a wide range of idea creation techniques.
    b. Create new and worthwhile ideas (both incremental and radical concepts).
    c. Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts.

Work Creatively with Others
    a. Develop, implement and communicate new ideas to others effectively
    b. Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work.
    c. Demonstrate originality and inventiveness in work and understand the real world limits to adopting new ideas.
    d. View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes Implement Innovations Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur.

When playing Puzzlets a child's creativity shines. Whether individually, in pairs or in whole class discussions students can get creative when playing through the levels because there is never just one right answer. Each level has multiple sequences of instruction that will work to pass. Students have the opportunity to decide if speed, water droplets or least number of Puzzlets used is most important to them and they can use their creativity to find the best solution for their problem.

P21 Standards Connected

Students can self-assess by asking themselves these questions:
- » Were you creative?
- » Did you try more than one way to get through a level?
- » Did you try a new line of code that you weren't sure would work?

CRITICAL THINKING AND PROBLEM SOLVING

Reason Effectively
a. Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation.
b. Use Systems Thinking.
c. Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems Make Judgments and Decisions.
d. Interpret information and draw conclusions based on the best analysis.
e. Reflect critically on learning experiences and processes.

Solve Problems
a. Solve different kinds of non-familiar problems in both conventional and innovative ways.
b. Identify and ask significant questions that clarify various points of view and lead to better solutions.

When playing Puzzlets students will be actively engaged in problem solving and critical thinking through game play. They will be innovative in design of their solutions and will use various styles of reasoning to develop their sequence of instructions. As the game progresses their thought and critical thinking will be continually challenged.

Students can self-assess by asking themselves these questions:
- » Did you think critically today?
- » When you were given a difficult problem did you work hard to try and find a solution to the problem?
- » Did you problem solve?

COMMUNICATION AND COLLABORATION

Communicate Clearly
a. Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts.
b. Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions.
c. Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade.)
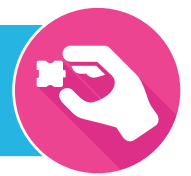
Collaborate with Others

a. Demonstrate ability to work effectively and respectfully with diverse teams.
b. Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal.
c. Assume shared responsibility for collaborative work, and value the individual contributions made by each team member.

Communication

When Playing Puzzlets in pairs using the *driver / navigator* technique (below) students will engage in actively communicating and making decisions with their partner. In order to play Puzzlets you must sequence your moves in order ahead of time. This is important because our students must discuss and think critically to decide on the best way to get through the level.

NAVIGATOR   **DRIVER**

Students can self-assess by asking themselves these questions:

» Did you communicate well with your partner?
» Did you share ideas and listen to their ideas?
» Did you ask questions?
» Are you able to communicate what you are doing in the game with adults or other peers?

Collaboration

When Playing Puzzlets in pairs using the driver/passenger technique (above) students will engage in constant collaboration. The Play Tray and iPad are true 50/50 play where each child plays an integral role in getting through the level. If they are unable to work together they will have great difficulty finding success.

Students can self-assess by asking themselves these questions:
   » Did you collaborative with your partner?
   » Did you work well together and try each other's ideas?
   » Were you kind?
   » Were you helpful?
   » Did you share?

LEADERSHIP AND RESPONSIBILITY

Guide and Lead Others
   a. Use interpersonal and problem-solving skills to influence and guide others toward a goal.
   b. Leverage strengths of others to accomplish a common goal.

When playing Puzzlets students will constantly be challenged with a more difficult problem to help Rus solve. Not only will they guide Rus and the other characters through the game but they will also guide their peers when working together to design a sequence. Playing this game will help students to develop these valuable skills that help define a leader.

Pre-Assessment

Name: **Date:**

	I don't understand.	I can do with help.	I can do it on my own!	I can help others!
I know what an algorithm is.				
I know what looping is.				
I know what debugging is.				
I know what it means to collaborate.				

Lesson 1: Get the Golden Puzzle Piece

LESSON OVERVIEW

In this lesson students will work with algorithms to move Rus through a maze to get to the puzzle piece. They will then work together to write a program to direct the teacher through a nine (9) block maze.

LESSON OBJECTIVES

Skills

Students will:
- » Work together in pairs to create an algorithm to solve six mazes.
- » Work together in small groups to create an algorithm that directs fellow students through a nine (9) square maze.

Core Vocabulary

Algorithm - *a step-by-step procedure for solving a problem.*

At a Glance

Getting Started
- » Gather students in whole group for lesson

Whole Group Instruction
- » Introduce vocabulary and activities

Small Group Work
- » Get the Golden Puzzle Piece Worksheet and Hands-On Activity

Wrap-Up
- » What's the learning?

Assessment
- » Self-Assessment 1

Lesson 1

ADVANCE PREPARATION

1. Make enough copies of the "Get the Golden Puzzle Piece" for pairs of students to complete.

2. Mark off a nine (9) square grid on the floor for students to use in groups of 4-6. If you have 12-inch square floor tiles, these work perfectly.

3. Print out enough copies of the "Small Group Pieces" for each group of 4-6 students to have one copy.

4. Make enough copies of "Self Assessment 1" for each student to fill out.

GETTING STARTED (5 MINUTES)

Introduce students to what they will be working on for the next 12 weeks.

WHOLE GROUP INSTRUCTION (10 MINUTES)

1. Introduce the new vocabulary word, "Algorithm."

2. Have students repeat the vocabulary word and guess its meaning.

   Algorithm - *a step-by-step procedure for solving a problem.*

3. Have students think about how an algorithm could be helpful to them. What tasks require an algorithm? e.g. brushing teeth, making a sandwich.

4. Tell students they are going to give you directions to move from one part of the room to another. Let them know that you will keep moving in a certain direction until they either change your direction or you run into an obstacle. You can have the students write each direction on the board and then choose one student to call out the directions at the correct time. Make certain to give each direction a unique agreed upon name e.g. left, right, up, down.

SMALL GROUP WORK (20 MINUTES)

1. Separate students into pairs and give them each a worksheet to work on. Stress the importance of working together. Have students brainstorm how each partner can contribute to the work.

2. Explain the directions of the worksheet and have them complete it.

3. When finished, break students into group of 4-6 and send each group to one of the nine (9) square grids.

4. Explain that one student will be on the grid and the other students need to write an algorithm to get him / her to the golden puzzle piece that will be on another part of the grid.

5. Stress that the student on the grid will continue to move until the other students tell him / her to change directions. Demonstrate the first time for the students.

WRAP-UP (5 MINUTES)

Review what was learned in the day's lesson and define Algorithm again.

ASSESSMENT (5 MINUTES)

Pass out and have the students individually complete Self-Assessment 1.

GET THE GOLDEN PUZZLE PIECE

Help Rus get to the golden puzzle piece as quickly as possible so that he can Cork the Volcano! Remember that Rus will keep moving in the direction you sent him in until you give him a new direction or until he runs into something.
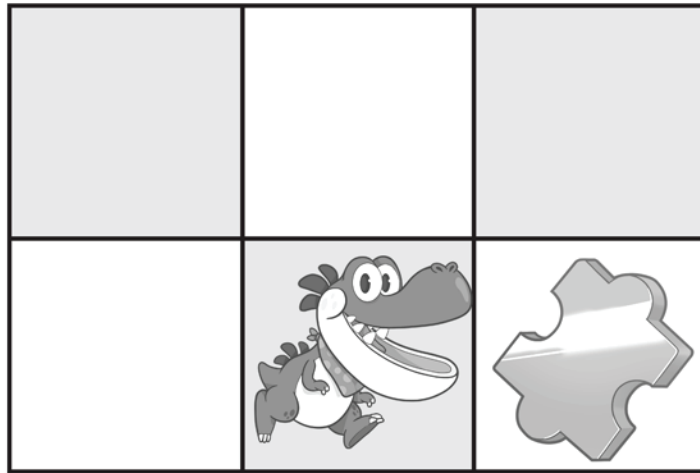
WRITE YOUR CODE HERE!
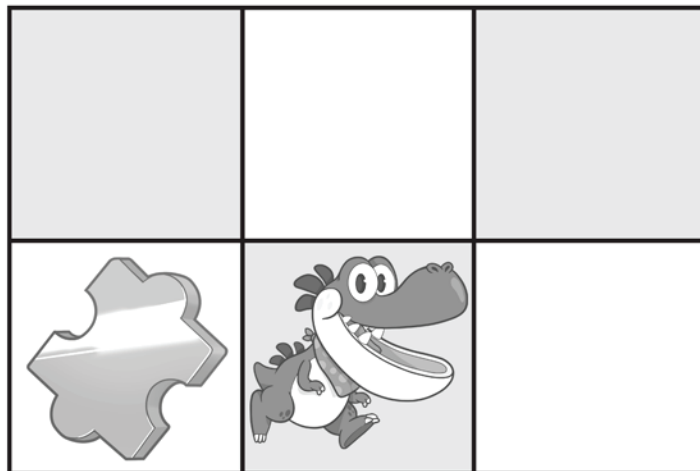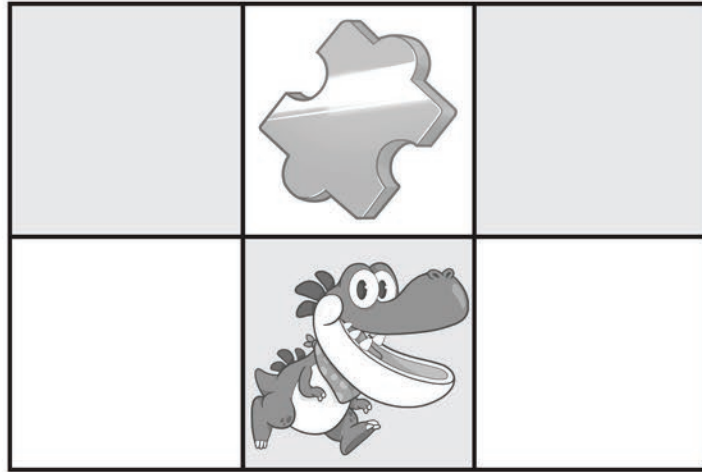
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GET THE GOLDEN PUZZLE PIECE (CONT.)

WRITE YOUR CODE HERE!
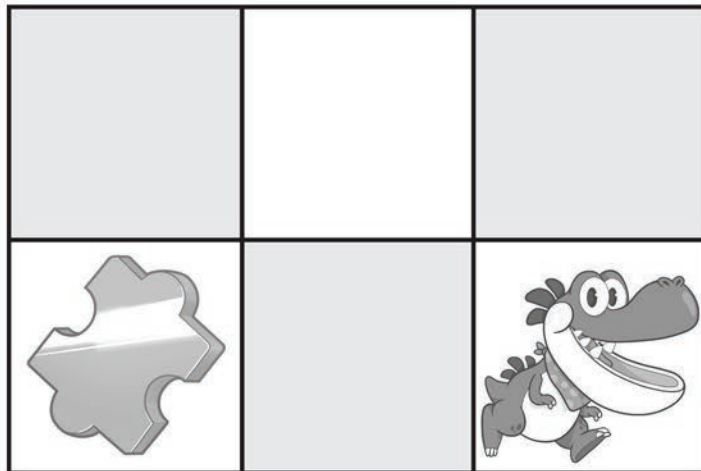
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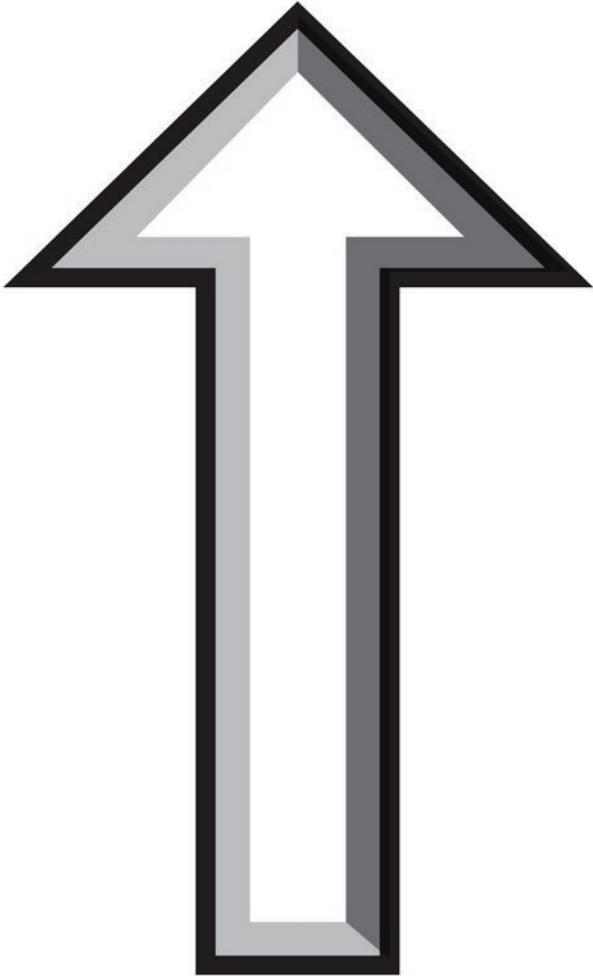# GET THE GOLDEN PUZZLE PIECE (CONT.)
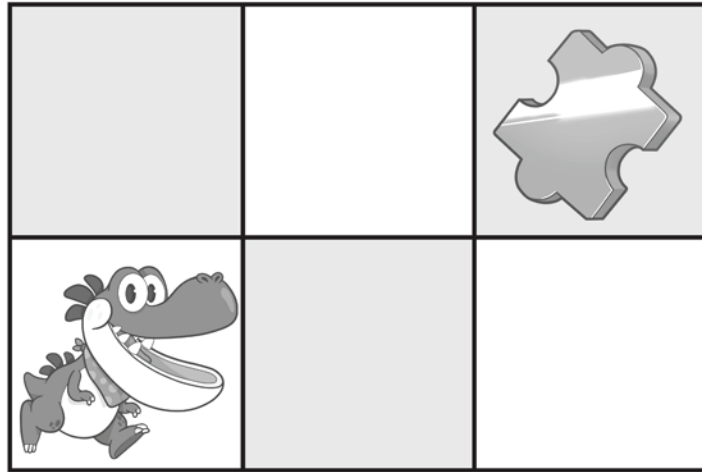
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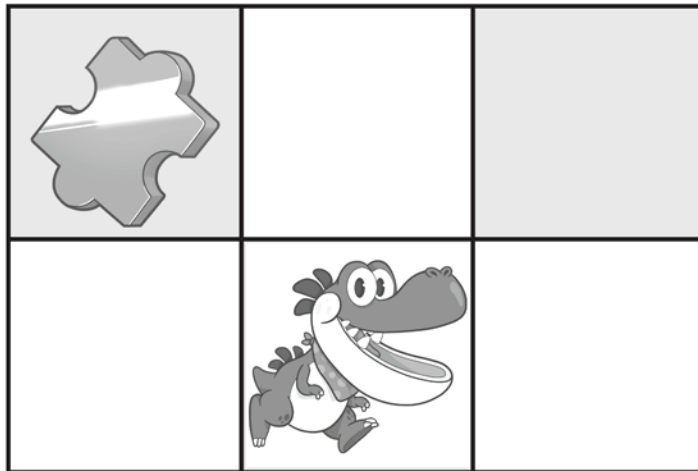
WRITE YOUR CODE HERE!

Lesson 1: Self-Assessment 1

Name: Date:

	😞 I don't understand.	😐 I can do with help.	😊 I can do it on my own!	😄 I can help others!
I know what an algorithm				
I can write an algorithm for my friends to follow.				
I can follow an algorithm.				
I can describe what an algorithm is.				

	😞 Not very much.	😄 A lot!
I enjoyed this activity:		

Lesson 2: Collaboration with Cork the Volcano
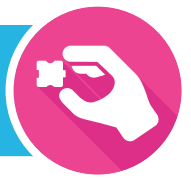
LESSON OVERVIEW

In this lesson students will be introduced to the concept of working together and will learn how to log into the game to begin play.

LESSON OBJECTIVES

Skills

Students will:
- » Work together as a class to create solutions to Cork the Volcano's puzzles.

Core Vocabulary

Collaboration - *to work with another person to accomplish a task.*

At a Glance

Getting Started
- » Gather students in whole group for lesson

Whole Group Instruction
- » Introduce vocabulary and activities

Small Group Work
- » None

Wrap-Up
- » What's the learning?

Assessment
- » None

Lesson 2

ADVANCE PREPARATION

1. Find the video clip on collaboration from the Hour of Code video library. The video is under the basics of computer science subheading and is titled "Pair Programming." Go to **code.org/educate/videos**

2. Find a way that you can project the Cork the Volcano game onto a screen for the entire class to see.

3. Pair a Play Tray with the computer or smart tablet you will be using for the demonstration.

GETTING STARTED (5 MINUTES)

Explain to the class that today they will be introduced to Cork the Volcano in preparation for next week.

WHOLE GROUP INSTRUCTION (35 MINUTES)

1. Introduce the new vocabulary word, "Collaboration."

2. Have students repeat the vocabulary word and guess its meaning.

   Collaboration - *to work with another person to accomplish a task.*

3. Have students think about how collaboration could be helpful when trying to solve a problem.

4. Show the Hour of Code "Pair Programming" video and then talk about how the students will be working together on the Puzzlets game. One student will be the *navigator* and put the programming tiles on the Play Tray and one student with be the *driver* and click the mouse for a computer or tap the screen for a smart tablet.

5. Discuss the video with the students highlighting how the partners collaborated to problem solve.

6. Project Cork the Volcano onto the screen for the whole class to view.

7. Walk them through the steps of setting-up to play the game.

   a. View the into sequence and narrate the story (found at the beginning of the curriculum).

b. Demonstrate to the students which game file they will sign into (File A, File B, or File C). Also have in mind the name you would like them to use as they will be paired up together for several weeks.

8. Play the first five levels with the students as a whole group.

   a. Demonstrate how the game gives you clues with each new puzzle piece.

   b. Point out where you need to tap the screen to move Rus.

   c. For one level, leave the previous programming tiles in the Play Tray so the students can see the "Clear the Play Tray" message.

   d. On level 1-5, demonstrate how the cloud needs to be tapped for each new direction.

9. As you are giving the demonstration, pose questions to the students about the procedures for playing the game.

WRAP-UP (5 MINUTES)

Tell students that next week they will be working in pairs on Cork the Volcano.

SMALL GROUP WORK / ASSESSMENT

There is Small Group Work or Assessment for this lesson.

Lesson 3: Playing Cork the Volcano

LESSON OVERVIEW

In this lesson students will work together to solve the Cork the Volcano puzzles.

LESSON OBJECTIVES

Skills

Students will:
- » Demonstrate ability to log into the Cork the Volcano game.
- » Collaborate to solve puzzles.

Core Vocabulary

Collaboration - *to work with another person to accomplish a task.*

At a Glance

Getting Started
- » Gather students in whole group for lesson

Whole Group Instruction
- » Introduce vocabulary and activities

Small Group Work
- » Use Puzzlets to work through the levels

Wrap-Up
- » What's the learning?

Assessment
- » Self-Assessment 2

ADVANCE PREPARATION

1. Ensure enough game units and computers or smart tablets for 2 students per station.
2. If using smart tablets, charge Play Trays ahead of time.
3. Ensure the Cork the Volcano game has been downloaded on each device.
4. As students will be working in pairs on the game, make certain to think about pairing strategy that can be continued for the next several weeks.

GETTING STARTED (5 MINUTES)

Explain to the class that today they will have the opportunity to play the Cork the Volcano game with a partner.

WHOLE GROUP INSTRUCTION (5 MINUTES)

1. Remind students about the vocabulary word, "Collaboration."
2. Have students repeat the word and define its meaning.

   Collaboration - *to work with another person to accomplish a task.*

3. Recap the last lesson, reminding the students about pair programming. Tell them one student must be the *driver* and one will be the *navigator*. They must not do the other person's job, they can problem solve together and discuss each other's job as long as they are working together and not taking over the entire process.

SMALL GROUP WORK (25 MINUTES)

1. Get students started at each station and determine the *driver* and *navigator*.
2. The driver will login to the Cork the Volcano game.
3. Encourage them to work together to problem solve.
4. Circulate around the room, helping as necessary.
5. Ask students to explain what they are doing.

6. Have students switch jobs half way through the session.

7. At the end of the session, have the students close the game.

WRAP-UP (5 MINUTES)

Have the students talk about what they learned today. Did they collaborate?

ASSESSMENT

Pass out and have the students individually complete Self-Assessment 2.

Lesson 3: Self-Assessment 2

Name: Date:

	😞 I don't understand.	😐 I can do with help.	🙂 I can do it on my own!	😄 I can help others!
I know what collaboration is.				
I worked well with my partner to solve the puzzles.				
I shared work equally.				
I was focused and on task.				

	😞 Not very much.	😄 A lot!
I enjoyed this activity:		

Lesson 4: Persisting at Puzzles

LESSON OVERVIEW

In this lesson students will continue to work together to solve the Cork the Volcano puzzles.

LESSON OBJECTIVES

Skills

Students will:
- » Demonstrate persistence in solving difficult puzzles.
- » Collaborate to solve puzzles.

Core Vocabulary

Persisting - *continuing to try to do something even though it is difficult.*

At a Glance

Getting Started
- » Gather students in whole group for lesson

Whole Group Instruction
- » Introduce vocabulary and activities

Small Group Work
- » Use Puzzlets to work through the levels

Wrap-Up
- » What's the learning?

Assessment
- » Self-Assessment 3

ADVANCE PREPARATION

1. Find and preview YouTube video: "Motivational Video: Mouse trying to get cracker (With Motivational Music)." Go to **www.youtube.com/ watch?v= Uc1PbkdqRno**

GETTING STARTED (5 MINUTES)

Explain to the class that today they will have the opportunity to play the Cork the Volcano game with a partner.

WHOLE GROUP INSTRUCTION (10 MINUTES)

1. Introduce the new vocabulary word, "Persisting."
2. Have students repeat the vocabulary word and guess its meaning.

   Persisting - *continuing to try to do something even though it is difficult.*
3. Show YouTube video, "Motivational Video; Mouse trying to get cracker (With Motivational Music)."
4. Have students brainstorm situations when persistence is necessary.
5. Recap the last lesson with the students, reminding them about pair programming. Emphasize collaboration and how each student has a specific job to do. They can problem solve together and discuss each other's job as long as the are working together.

SMALL GROUP WORK (20 MINUTES)

1. Get students started at each station and determine the *driver* and *navigator*.
2. The driver will login using the previous week's login name so that they can continue the game where they previously left off.
3. Encourage them to work together to problem solve.
4. Circulate around the room, helping as necessary.
5. Ask students to explain what they are doing.
6. Have students switch jobs half way through the session.
7. At the end of the session, have students close the game.

WRAP-UP (5 MINUTES)

Have the students talk about what they learned today. Did they collaborate? Was there a time where they needed to persist when trying to solve a puzzle?

ASSESSMENT

Pass out and have the students individually complete Self-Assessment 3.

Lesson 4: Self-Assessment 3

Name: Date:

	😞 I don't understand.	😐 I can do with help.	🙂 I can do it on my own!	😄 I can help others!
I know what persistence is.				
I worked well with my partner to solve the puzzles.				
I shared work equally.				
I was focused and on task				

	😞 Not very much.	😄 A lot!
I enjoyed this activity:		

Lesson 5: Debug Rus

LESSON OVERVIEW

In this lesson students will be introduced to the concept of debugging and practice debugging programs.

LESSON OBJECTIVES

Skills

Students will:
- » Analyze a program.
- » Find and correct the algorithm.

Core Vocabulary

Debug - *to identify and remove errors of a program.*

At a Glance

Getting Started
- » Gather students in whole group for lesson

Whole Group Instruction
- » Introduce vocabulary and activities

Small Group Work
- » Identify and debug programs

Wrap-Up
- » What's the learning?

Assessment
- » Self-Assessment 4

Lesson 5

ADVANCE PREPARATION

1. Make enough copies of "Debug Rus" for students to work on.
2. Make enough copies of "Re-Write My Wrong" for students to work on in pairs.

GETTING STARTED (5 MINUTES)

Explain to the class that today they will have the opportunity to play the Cork the Volcano game with a partner.

WHOLE GROUP INSTRUCTION (10 MINUTES)

1. Introduce the new vocabulary word, "Debug."
2. Have students repeat the vocabulary word and guess its meaning.

   Debug - *to identify and remove errors from a program.*
3. Have students think about how the process of debugging could be helpful when trying to solve a problem.
4. Put the first "Debug Rus" puzzle on the board to work through with the students.
5. Hand out the "Debug Rus" worksheets to the students for them to fix.
6. Introduce and give directions for the small group work of "Re-Write My Wrong."

SMALL GROUP WORK (20 MINUTES)

1. Have students break into pairs.
2. Hand out the "Re-Write My Wrong" game boards and puzzles pieces to play with their partner.
3. Circulate around the room, helping as necessary.
4. Ask students to explain what they are doing.
5. Have students switch jobs half way through the session.
6. At the end of the session, have students close the game.

WRAP-UP (5 MINUTES)

Have the students talk about what they learned today. Did they collaborate? How is debugging helpful when working on the game?

ASSESSMENT

Pass out and have the students individually complete Self-Assessment 4.

DEBUG RUS
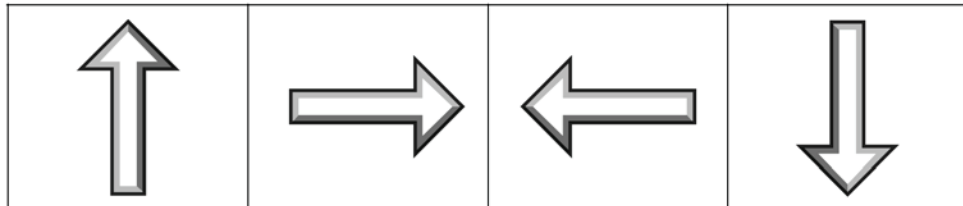

Debug the algorithm below.

DEBUG RUS

Debug the algorithm below.

DEBUG RUS

Debug the algorithm below.

DEBUG RUS
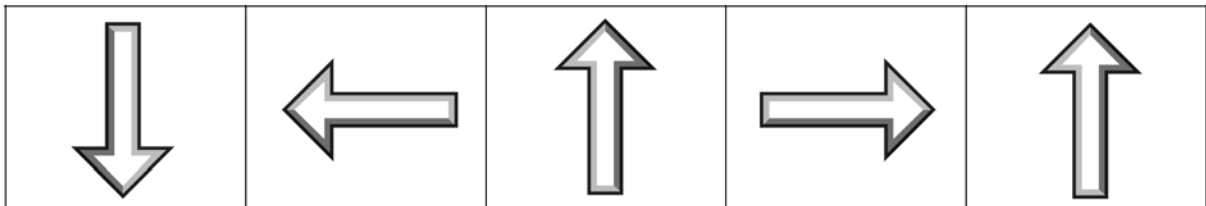

Debug the algorithm below.

DEBUG RUS

Debug the algorithm below.

RE-WRITE MY WRONG DIRECTIONS AND GAME PIECES

Directions:
Cut out game pieces below.
Player One:
1. Put Rus onto a square on the game board.
2. Put the Golden Puzzle Piece onto the game board.
3. Add on some Volcanoes (these are squares you can not go onto).
4. Write the program to get Rus to the Golden Puzzle Piece.
5. Change one or more directions so that your partner has to debug it
   to get to the Golden Puzzle Piece.
Player Two:
1. Analyze the program to discover where the problem is.
2. Re-write the program below your partners program.
3. Walk your partner through the solution to ensure you agree the
   solution is correct.
Switch jobs and start again.
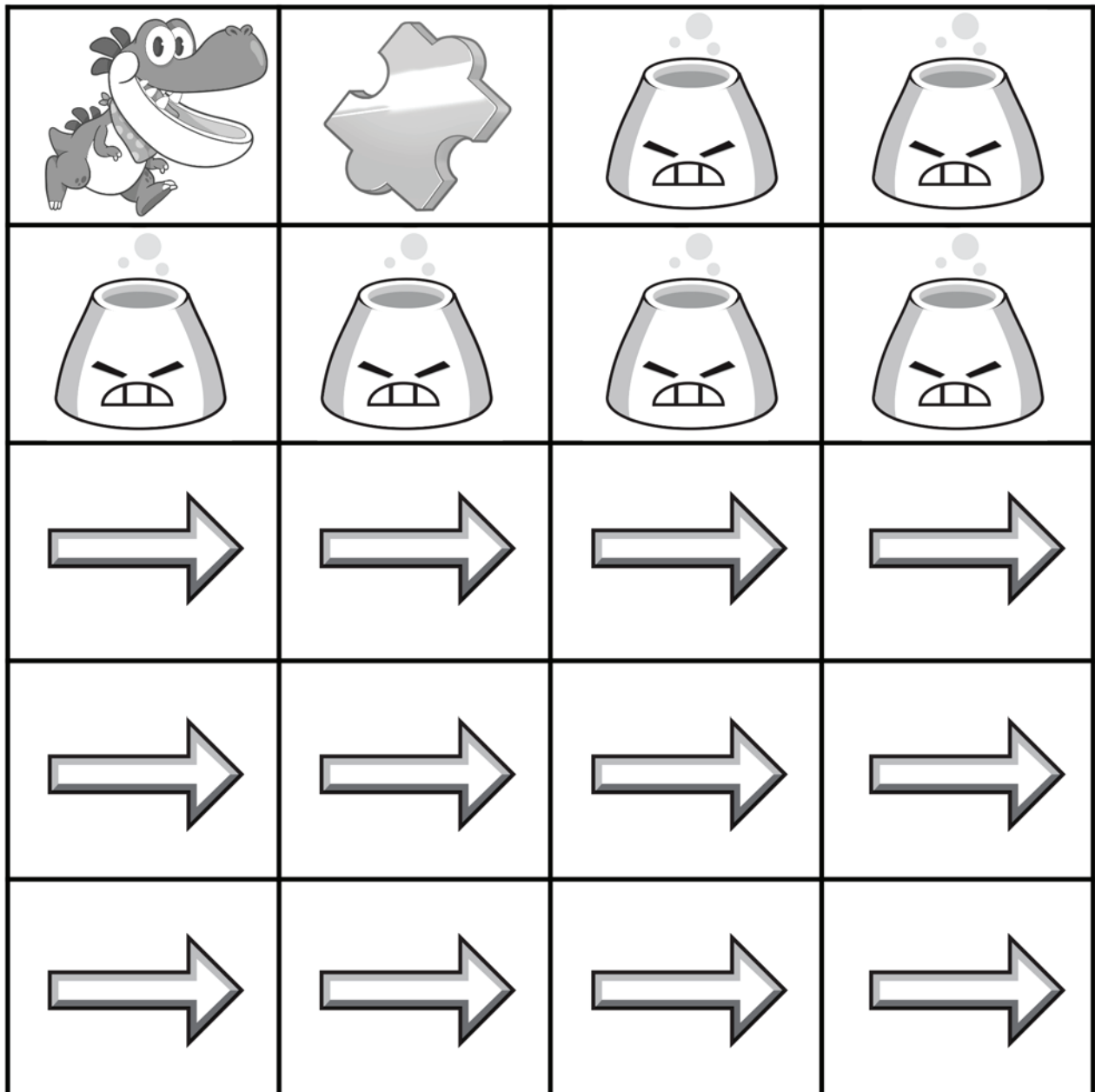
Re-Write My Wrong Game Board

Lesson 5: Self-Assessment 4

Name: **Date:**

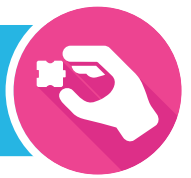|	😞 I don't understand.	😐 I can do with help.	🙂 I can do it on my own!	😄 I can help others!
I know what debug means.				
I can debug an algorithm to solve a puzzle.				
I can describe what debug means.				
I was focused and on task.				

	😞 Not very much.	😄 A lot!
I enjoyed this activity:		

Lesson 6: Loop It

LESSON OVERVIEW

In this lesson students will be introduced to the concept of looping programs.

LESSON OBJECTIVES

Skills

Students will:
- » Analyze a program and find opportunities to shorten the program through looping.

Core Vocabulary

Loop - *repeat an action over and over again.*

At a Glance

Getting Started
- » Gather students in whole group for lesson

Whole Group Instruction
- » Introduce vocabulary and activities

Small Group Work
- » Identify and debug programs

Wrap-Up
- » What's the learning?

Assessment
- » Self-Assessment 5

ADVANCE PREPARATION

1. Pull up Puzzle 1-5 to project on board for the whole group work.

GETTING STARTED (5 MINUTES)

Explain to the class that today they will learn what the ×2 and ×3 programming tiles do.

WHOLE GROUP INSTRUCTION (10 MINUTES)

1. Introduce the new vocabulary word, "Loop."
2. Have students repeat the vocabulary word and guess its meaning.

   Loop - *repeating an action over and over again.*
3. Put the sequence of "Clap Your Hands" on to the board.
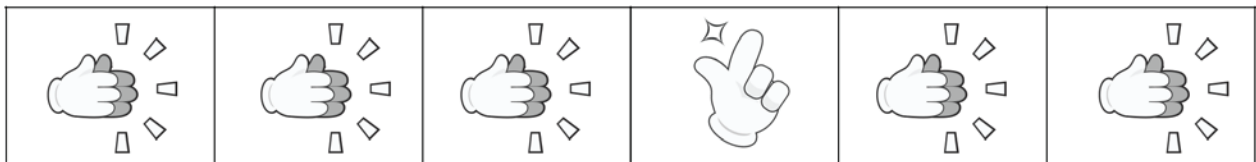
4. Have the students follow the sequence.
5. Ask if they know a better way to make the directions shorter.
6. After they have brainstormed, show them the shortened version. Explain how this helps when playing the game.

7. Pull up level 1-5 puzzle and solution.

8. Demonstrate how this can be written using the ×2 and ×3 programming tiles.

9. Tell the students to find opportunities to use the ×2 and ×3 programming tiles while playing the game.

SMALL GROUP WORK (20 MINUTES)

1. Get students started at each station and determine the *driver* and *navigator*.

2. The driver will login.

3. Encourage them to work together to problem solve and remind them to use the ×2 and ×3 programming tiles when possible.

4. Circulate around the room, helping as necessary.

5. Ask students to explain what they are doing.

6. Have students switch jobs half way through the session.

7. At the end of the session, have students close the game.

WRAP-UP (5 MINUTES)

Have the students talk about what they learned today. Did they use the ×2 and ×3 programming tiles to loop a direction? How is looping helpful when working on the game?

ASSESSMENT

Pass out and have the students individually complete Self-Assessment 5.

Lesson 6: Self-Assessment 5

Name: Date:

	😞 I don't understand.	😐 I can do with help.	😊 I can do it on my own!	😄 I can help others!
I know what looping is.				
I can use looping to make an algorithm shorter.				
I can describe what looping is.				
I can follow looping directions.				

	😞 Not very much.	😄 A lot!
I enjoyed this activity:		

Post-Assessment

Name: **Date:**

	😞 I don't understand.	😐 I can do with help.	😊 I can do it on my own!	😄 I can help others!
I know what an algorithm is.				
I know what looping is.				
I know what debugging is.				
I know what it means to collaborate.				

	😞 Not very much.	😄 A lot!
I enjoyed this activity:		