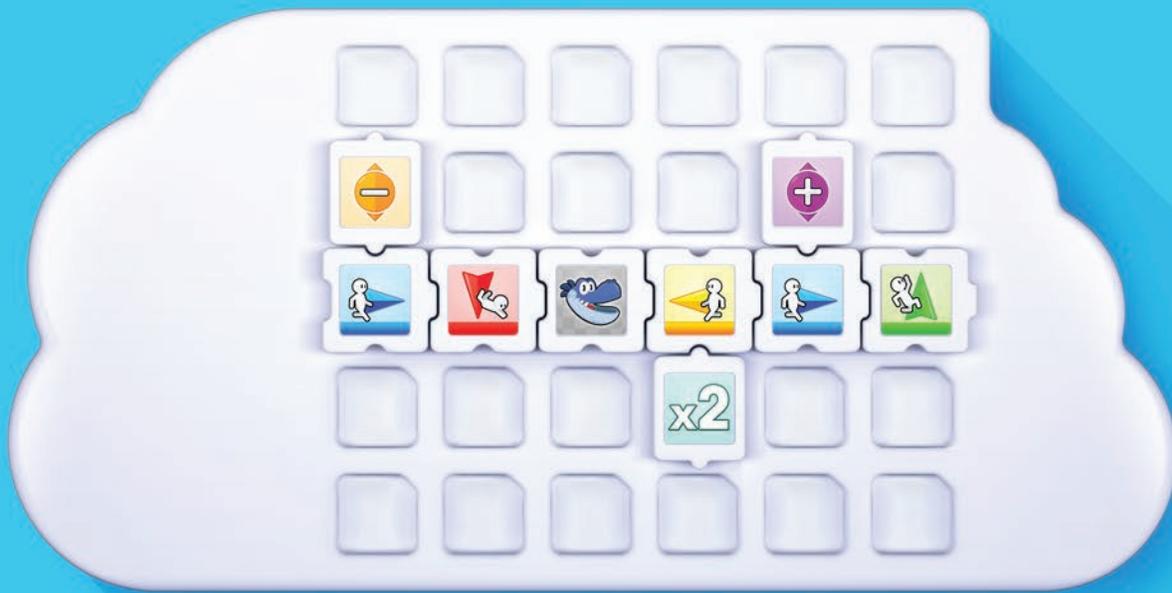


# PUZZlets™

## Curriculum



GRADES  
K-2



## 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.



## 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 there 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.



## 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.



## 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.



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



## 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.



## 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

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

### Solve Problems

- Solve different kinds of non-familiar problems in both conventional and innovative ways.
- 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

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



## Collaborate with Others

- Demonstrate ability to work effectively and respectfully with diverse teams.
- Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal.
- 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 collaborate 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.

# 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.

## Lesson 3



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: