

Tech Gr 2 Unit 2- Problem Solving Through Programming

Content Area: **Technology**
Course(s): **STEM-Technology**
Time Period: **Two Weeks**
Length: **2nd Marking Period**
Status: **Published**

Stage 1 - Learning Outcomes

Unit Overview

Standard 8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Strand E. Computational Thinking: Programming: *Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.*

Enduring Understandings

- Computer programming is a tool used to help us solve problems, create, and design.

Essential Questions

- How does computer programming help us solve problems, create, and design?

Interdisciplinary Connections

1. Common Core Literacy

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|---------------------------------|--|
| LA.2.CCSS.ELA-Literacy.CCRA.R.7 | Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. |
| LA.2.CCSS.ELA-Literacy.CCRA.SL1 | Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. |

CCSS.ELA-Literacy.RF.2.4.a	Read grade-level text with purpose and understanding.
CCSS.ELA-Literacy.RI.2.5	Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.
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.2.3	Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

2. Common Core Math

- 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.MP5 Use appropriate tools strategically.
- CCSS.MATH.PRACTICE.MP6 Attend to precision.
- CCSS.MATH.PRACTICE.MP7 Look for and make use of structure.

3. Career Ready Practices

- CRP11. Use technology to enhance productivity.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Stage 2 - Assessment

Formative Assessment

Teacher observation of students' progress

Teacher observation of completed projects

Teacher observation of student cooperation and class discussion

Matrix of skill development

Students will use their Google Apps account to login to CODE.ORG
and will provide evidence of completion of at least 4 lessons in Course 2.

<https://studio.code.org/s/course2>

Teacher must setup a "class code" in advance of students logging on with their Google accounts.

Students will enter this class code after logging in the first time (using their Google Apps account) but before beginning any work. After students have completed their work, teacher can view/print evidence of what Code.org lessons students have completed.

End of Unit/Benchmark Assessments

Stage 3 - Learning Plan

Suggested Activities

- Blockly <https://blockly-games.appspot.com/maze>
- What most schools don't teach - Why Code? Code.org video <https://www.youtube.com/watch?v=nKIu9yen5nc>
- BotLogic <http://botlogic.us/play>
- Code.org <http://code.org>
- Coding Symbaloo created by Shannon Miller <http://www.symbaloo.com/mix/coding-coding-coding>
- Daisy the Dinosaur app <https://itunes.apple.com/us/app/daisy-the-dinosaur/id490514278?mt=8>
- Have a student "program" another student to move through the classroom - Kevin Jarrett lesson here <http://blogs.ncs-nj.org/k4stemlab/?p=1792>
- Human Computer Activity: <http://csunplugged.org/activities/>
- Lightbot <http://lightbot.com/hocflash.html>
- Madewithcode <https://www.madewithcode.com/>
- Participate in the Hour of Code on Code.org or Tynker
- Purple Mash Coding Section (subscription)
- Teacher discussion of **vocabulary (algorithm, input, output, operating system, debug)**
- Teacher discussion of why we should learn coding - we use technology everyday and it is good to view "behind the scenes," because more careers will rely on computer programming, and because coding makes you think differently - try it out, make mistakes, and learn that way!
- Tynker <https://www.tynker.com/>
- Play Code Monkey <https://www.playcodemonkey.com>

LESSON STRATEGIES:

- Interactive mini lecture/notes – Students take notes, answer questions, turn and talk, participate in class discussions, look up information in text/online.
 - Do Nows – At start of class, students answer questions, reflect on learning, work on typing.com
 - Video Clips- Shown to aid learning by providing a visual, engage the class
 - Demonstrations- To enhance student learning, ignite curiosity, spur discussion, provide a visual, engage the class
 - Research questions- Students are given a broad question to research. Students answer the question and provide evidence for their responses. (Independent or collaborative)
 - Journaling- Responses to various ideas, thoughts, class activities, and content.
 - Reflecting on Learning- Students self reflect on their learning and “rate” themselves on a learning scale.
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Supportive Strategies

1. Special Education

- Employ assistive technology as needed (For example, use of Dyslexie font, high contrast or screen magnification on Chromebook, or spoken text features)
- Graphic Organizers
- Modifications on IEP
- Provide written and oral directions, utilizing visuals and exemplars. (For example, teacher will model on ActivBoard how to complete a Code.org activity and login. Teacher will point out the "HINT" section of the website that aids students in completing each activity.)
- Reduction in workload
- Repetition and Reinforcement of classroom material
- Strategic Grouping for all group work

2. ESL

- For collaborative assignments, appropriate roles will be assigned. (For example, time-keeper, activity starter)
- Employ assistive technology as needed (For example, online translation or Language text settings on Chromebook)
- Make content culturally relevant
- Partner English Learners with Strong English Speakers
- Provide written and oral directions for all lessons, utilizing visuals and exemplars
- Repeat classroom procedure and routines as much as possible to reinforce language learning
- Visual Aids

3. Student at risk of failure

- Employ assistive technology as needed (For example, use of Dyslexie font, high contrast or screen magnification on Chromebook, or spoken text features)
- Flexible acceptance of missing/lost/incomplete assignment
- Strategic Grouping for all group work

4. Gifted and Talented

- Higher level learners will be provided with more intellectually demanding learning activities. (For

example, teacher will encourage advanced students to complete as many levels as they wish in Course 2 of Code.org)

- Higher Order Questioning
- Utilize different reading levels appropriate for students

Core Instructional Materials/Resources

- Bee-Bot <https://www.bee-bot.us/>
- Chromebooks, iPads or other internet-connected devices
- Code.Org Inspirational Videos - <https://code.org/educate/inspire>
- CS Unplugged website - <http://csunplugged.org/>
- See list of coding websites listed in “Suggested Activities” section.