**Computers Bug Me!**

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**Lesson Overview**

**Learning Objectives and Evidence Statements**

LO 1.2.1: use computing tools and techniques for creative expression

**Big Idea: Creativity Abstraction  Data  Algorithms**

**Programming Internet Impact**

**Sub Idea(s): Creativity Abstraction  Data  Algorithms**

**Programming Internet  Impact**

**Teacher Preparation & Reading List**

* <http://www.nytimes.com/2014/02/09/education/edlife/creativity-becomes-an-academic-discipline.html>
* <http://www.forbes.com/sites/alexknapp/2013/12/27/to-foster-your-creativity-dont-learn-to-code-learn-to-paint/>
* <http://www.instructables.com/id/Computer-Bugs/>
* <http://www.businessinsider.com/10-stunning-objects-made-from-ugly-computer-parts-2012-2#now-check-out-some-other-amazing-examples-of-old-meets-new-11>
* <http://www.wired.com/wiredscience/2013/12/googles-doodle-honors-grace-hopper-and-entomology/>
* <http://newsfeed.time.com/2013/12/09/google-doodle-honors-grace-hopper-early-computer-scientist/>

**Supplies Needed for this Lesson:**

1. Discarded/donated CPUs
2. Notecards or Stickers
3. Markers
4. Drill, Screwdrivers, pliers, wire clippers
5. Small gauge wire
6. Glue – super glue or low-temp hot glue

**Prerequisite knowledge**

None – this is an activity for the beginning of the school year

**Essential/Guiding Question(s)**

* What is a computer?
* What parts are inside a CPU or laptop?
* What is a computer bug?
* Who is Grace Hopper and what impact did she make on computing?
* What is a computer virus?
* How do computer viruses spread?

**Lesson Details & Student Activities**

|  |  |  |  |
| --- | --- | --- | --- |
| **Title** | **Resources** | **Day** | Minutes |
| What is a computer? | <http://computer.howstuffworks.com/ultimate-computer-hardware-videos-playlist.htm>  Show students video of what is inside a computer | 1 | 20 minutes |
| Label a CPU | Create groups in the class; give each group one CPU to take apart and label the parts; observe groups and quiz for understanding. | 1 | 30 minutes |
| Who is Grace Hopper?  What is a Computer Bug? | Through teacher-led discussion, articles, video clips, students will learn about Grace Hopper and computer bugs   * <http://www.wired.com/wiredscience/2013/12/googles-doodle-honors-grace-hopper-and-entomology/> * <http://newsfeed.time.com/2013/12/09/google-doodle-honors-grace-hopper-early-computer-scientist/> * <http://www.cbsnews.com/news/grace-hopper-she-taught-computers-to-talk/>   \*qualifies as a CCRS Activity: Close Reading Activity | 2 | 20 minutes |
| Destructive Computer Viruses | Partner teams should research computer bugs and identify at least one destructive computer virus and report to the class their findings. Teams should compare/contrast a “bug” to a virus. | 2 | 30 minutes |
| Create a Bug | Student groups or teams may now “RAID” the CPUs used on Day 1 to create a bug, piece of jewelry, robot, etc. Students will present their inventions to the class after two days of work.  *NOTE: Consider having the class vote on the creations based on creativity, number of parts used, execution of idea/theme, etc.* | 3-4 | 50 minutes |
| Assessment & Conclusion | Student creative presentations/voting  Summative Assessment on Lesson terms, concepts, content  Reflective writing based on lesson components | 5 | 50 minutes |

**Student Supplemental Outside of Class Activities to Learn More**

***NOTE: Share these resources for students to go beyond the classroom***

|  |  |
| --- | --- |
| **Title** | **Resources** |
| Intel: The Journey Inside  Students may watch and learn from the Intel resources to learn more about the history of computers, computer components, processes and more. | <http://www.intel.com/content/www/us/en/education/k12/the-journey-inside/explore-the-curriculum/intro-to-computers/lesson2.html> |
| The FBI & Cybercrime | <http://www.fbi.gov/about-us/investigate/cyber> |

**Teaching and Learning Strategies**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Title** | **Teaching Tips** | | **Day** | | Minutes |
| What is a computer? | * Show students the inside of a CPU; ask if anyone knows the names for all the components; discuss comments * Show video and then check for understanding; review terminology and key terms | | 1 | | 20 minutes |
| Label a CPU | * Discuss tool safety and establish guidelines * Assign groups and work areas * Monitor groups and check for understanding as each labels parts; * Allow time for classroom clean up and summarize day’s lesson terms | | 1 | | 30 minutes |
| Who is Grace Hopper?  What is a Computer Bug? | * Distribute article from *Wired* * Guide reading and discussion * Show video links and relate her contribution to computer science * Introduce the term “computer bug” and contrast to a computer virus | | 2 | | 20 minutes |
| Destructive Computer Viruses | * Monitor teams while researching; check for understanding and appropriate sources * Facilitate group presentations of findings; ask probing questions to relate findings to student experiences. Example, “do you have Norton’s Anti-Virus or McAfee on your home computer?” * Close class by reviewing key terms. * Add terms to Word Wall if using one in classroom | | 2 | | 30 minutes |
| Create a Bug | * Allow students to form teams or partners and give each a CPU or device for use in creating their item * Show examples of what may be created from websites listed on Page 1 of this lesson plan * Encourage students to only use computer parts, mouse parts, CDs, disks, cables, etc. in their creative product * Foster interest by making it a “show” or competition | | 3-4 | | 50 minutes |
| ***SHOW OFF STUDENT WORK! Request that finished creations be displayed in your school showcase, library, or main office. Create a gallery of creations and get administration, faculty involved.*** | | | | | |
| Assessment & Conclusion | * Conclude the unit with student creative presentations, assessment of terms, concepts, etc. * Based on individual classes and time allowance this day may be used in a variety of ways. | 5 | | 50 minutes | |

**Appendices**

**Materials and Resources**

1. Discarded/donated CPUs
2. Notecards or Stickers
3. Markers
4. Drill, Screwdrivers, pliers, wire clippers
5. Small gauge wire
6. Glue – super glue or low-temp hot glue

**Supplemental Resources**

Contact your school’s art department for suggestions, supplies or recommendations about the creative portion of this lesson. Collaborate with colleagues who are familiar with student projects of this type.

**A few Sample Images of Creations from CPU and Device Parts**



