Pathways to Success with Computer Science

1. Question & Research Task

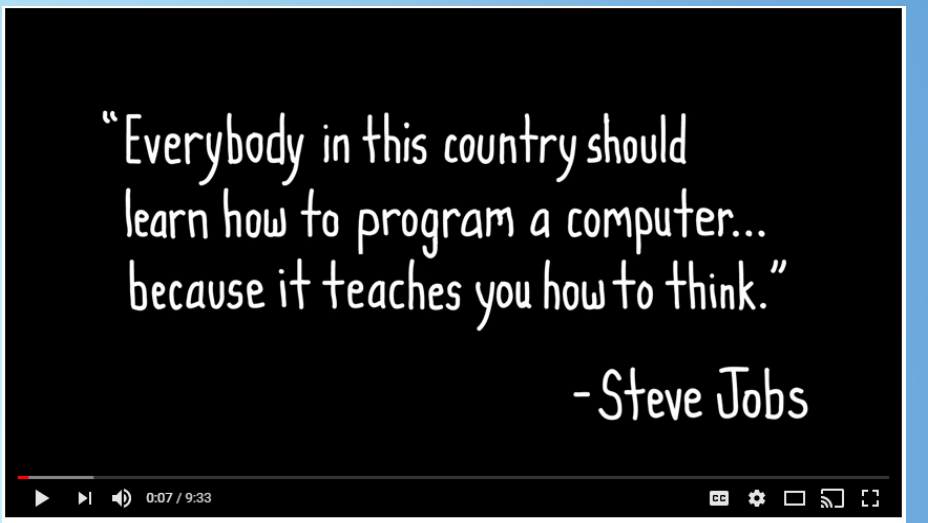
Workers with computer science skills are in high demand by employers, and not just for high-tech jobs like computer programmers and software engineers. Nearly 2/3 of jobs where computer science skills are valued are not in the technology industry. Unfortunately, it is estimated that by 2020 there will be a "skills gap" of one million workers who do not have the computer science skills needed for today' jobs.

BCPS students have a variety of opportunities to begin learning computer science skills. This includes programs like Hour of Code, "maker" learning, the Mobile Innovation Lab, after-school activities, and EYLP Math class.

- Reflect on any experiences you have already had with learning "coding" or computer programming, in school or outside of school. Share with your group.

Learning computer science skills benefits students in many different ways. Computer science also has wide-ranging benefits for society. People with computer science skills can change the world! No matter what field you want to go into, Computer Science is changing that industry. Computer Science is changing everything!

- Use the linked videos and articles on this slide to discover some benefits of computer science. Take notes and share insights with your group.



"Code Stars" - Short Film

Watch "Code Stars" – a short film which explains why computer programming is the new "superpower."

Use this **Checklist** throughout the Slam Dunk to keep track of your progress and let your teacher know when you need help.

In this Slam Dunk, you will research computer science educational options and careers to answer to the inquiry question:

Where could computer science skills lead you?

2. Information Sources

SLIDE NAVIGATION

You will choose information sources linked here to complete the Student Activities on Slide 3.

1. Background information about computer science:

- What is Computer Science? Interactive module (see #1-5) | Computer Programming BrainPop video
- Vocabulary reference sheet – Use this to help you understand computer science-related words you encounter in the resources

2. Educational options for learning computer science skills:

- **BCPS High School programs and courses:** CTE (Career & Technology Education) programs | Magnet programs
- **College programs, majors, certificates:**
  - **CCBC:** Programming Certificate | Computer Science | Computer Science/Information Systems Management | Video Game Design courses | Mobile Development Certificate
  - **Towson University:** Undergraduate programs in Computer & Information Sciences | Computer Science |
  - **UMBC:** Meet the Students | Computer Science | Computer Science four-year plans | Cybersecurity Academy | Game Development
- **Informal learning opportunities:** See the resources on Slide 5

3. Careers in computer science:

- Careers in Tech video profiles | Coders Who Smash Stereotypes: Careers in Code | Careers in Computer Science
- *Careers with Code* magazine: Shape Tomorrow's World | Creative Computer Science Careers *Some print copies will be provided.
- **Career OneStop video profiles:** Computer Programmers | Computer & Information Research Scientists | Software Developers Video Game Designers | Web Developers
- **College Board "Big Future" Career Profiles:** Computer Programmers | Software Developers | Web Designers

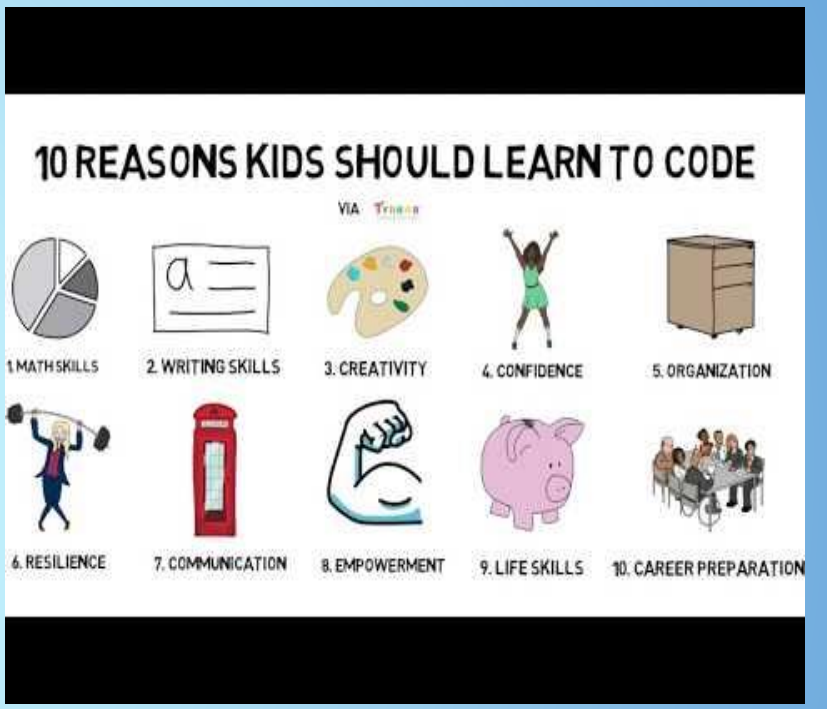
3. Student Activities

Use the resources on Slide 2 to complete each activity:

1. **Build some background knowledge about computer science** to:
   - **a.** View/read #1-5 in the **What is Computer Science?** interactive module
   - **b.** Take the **QUIZ** after the ***Computer Programming*** **BrainPop video** to check your understanding.
   - **c.** Have your teacher/librarian show you the video on the right 10 Reasons Kids Should Learn To Code.

2. **Explore educational options for learning computer science skills** to **take some notes** about:
   - **a.** BCPS Career & Technology Education (CTE) courses and programs
   - **b.** BCPS Magnet programs
   - **c.** College programs
   - **d.** Informal learning opportunities

3. **Research some careers where computer science skills are useful** to **answer these questions** about two careers:
   - What skills, education or training are needed?
   - What do workers do on the job?
   - Where do people do this job? What are working conditions like?
   - What is the potential salary?



Select the image above to watch the video, 10 Reasons Kids Should Learn To Code. Your teacher/librarian may have to show you the video.

4. Assessment Activity

Use knowledge from your research to design a **Pathway to Success with Computer Science.** Your pathway should illustrate **how BCPS students can develop computer science skills,** and **where these skills could lead them in the future.**

- Your teacher/librarian may have you program an Ozobot (representing a BCPS student) to follow the pathway on a paper template they provide.

Label the "stops" along your pathway with some key information from your research notes, including:

- A **BCPS CTE program, course** or **Magnet program** related to computer science.
- A **college program or major** where computer science skills could be further developed to prepare for a career.
- An **informal learning opportunity** a student could use to learn and practice computer science skills on their own.
- An example of a **career choice** where computer science skills would be required or valued.

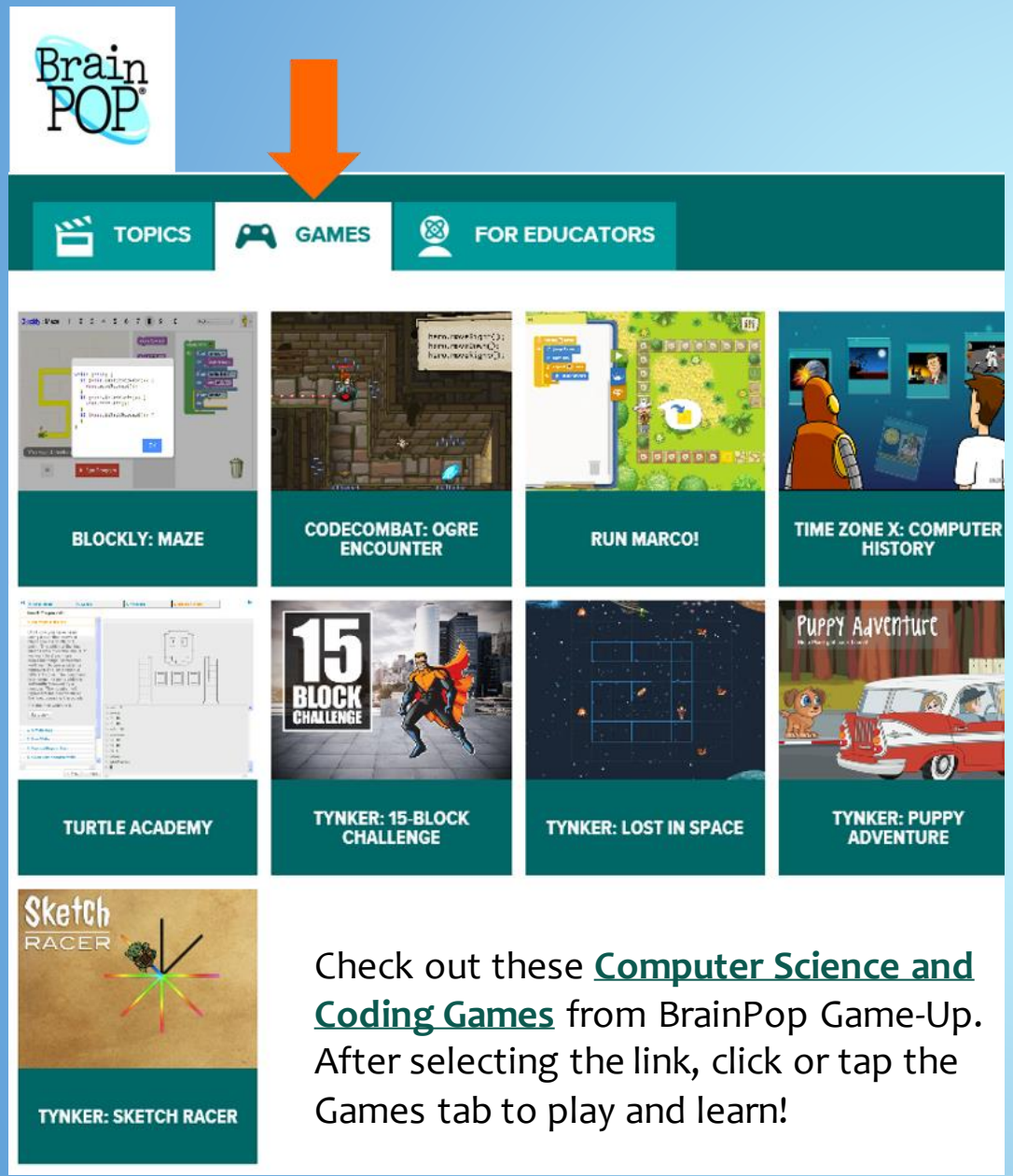
Use your Pathway to explain to classmates how BCPS students can develop computer science skills, and where these skills could lead them in the future.

- If you programmed an Ozobot "student," explain as your Ozobot follows the labeled pathway

Use the success criteria on this **Rubric** to help you do your best work.

Image Sources : http://hellowonderful.co http://thenouneproject.com

5. Enrichment Activities



Check out these **Computer Science and Coding Games** from BrainPop Game-Up. After selecting the link, click or tap the Games tab to play and learn!

Informal learning opportunities:

Learn and practice computer science skills on your own!

- **Self-paced** Coding Courses for students in Grades 6-12 from Code.org
- Computer Programming **learning modules** from Khan Academy
- Find a local Computer Science class
- Tynker kids coding games
- Code Club Projects

Family Resources:

Share these with your parents/guardians and family members!

- Tips for Parents Who Want to Help Their Child Learn More About Computer Science
- 9 Reasons Your Child Should Learn to Code
- Computer Science Toolkit for Parents

6. Teacher Resources

Learning Standards Alignment

Maryland Career Development Framework Standards (Grades 6-8)

Standard 2: Career Awareness: Students will use the Maryland Career Clusters and Pathways in order to understand their relationship to educational achievement and lifelong learning.

A.1a. Identify career clusters and related CTE programs of study. **A.1c.** Research occupations and careers within each career cluster and identify academic and CTE programs of study to inform academic and career planning.

Standard 3: Career Exploration: Students will assess Career Cluster choices and related pathways in order to develop an academic and career plan. **A.3.** Investigate program sequences for career clusters including CTE programs of study of interest that overlap with other career pathways.

Common Core State Standards

Reading: 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Writing: 7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AASL Standards Framework for Learners

1.1.6 Read, view, and listen for information presented in any format (e.g. textual, visual, media, digital) in order to make inferences and gather meaning.

2.1.3 Use strategies to draw conclusions from information and apply knowledge to curricular areas, real-world situations, and further investigations.

P21 Framework: 21st Century Student Outcomes

3. Information, Media & Technology Skills: Information Literacy: Access information efficiently and effectively; Use information accurately and creatively for the issue or problem at hand.

Middle School CTE

Objective: Students will be conduct brief, focused research in share information about educational options and potential career pathways in computer science.

Time Frame: Two to three 90-minute periods.

Differentiation strategies for this lesson:

- Some videos in this lesson may not be closed-captioned; alternative text-based resources are provided. Teacher may screen the YouTube version of some videos if a student's disability requires closed captioning.
- Students should reference the Vocabulary sheet to define unfamiliar computer science terms encountered in the information sources. Students may also use an online dictionary to define other terms.
- Some linked articles/webpages could be provided on paper if needed for highlighting/annotating.

Notes to the teacher:

- **SLIDE 1:** Provide paper copies of the **Slam Dunk Checklist** and **Benefits of Computer Science note-taking sheet**.
- **SLIDE 2-3:** Review/model the process for using the Information Sources on **Slide 2** to complete each of the three Student Activities on **Slide 3**.
- **SLIDE 2:** Provide paper copies of the Vocabulary sheet to help students define unfamiliar computer science terms in the information sources.
- **SLIDE 3:** Provide paper copies of the and **note-taking sheets for #2 Educational Options and #3 Careers**.
- **SLIDE 4:** Provide paper copies of the **Rubric** for student reference, the Ozobot pathway template and other necessary equipment/supplies.
- **Slide 5:** Allow students to explore the Enrichment Activities as time permits. Message parents about Family Resources.
- Consider using the Schoology Assignment Apps feature to assign Microsoft/Google Docs for students to access, edit, and submit through Schoology.

Last updated: **July 2021** Created by **Kelly Ray, Resource Teacher – BCPS Library Media Programs & Digital Resources** Report broken links to: 443-809-4035