Introduction to Computer Science

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Welcome Students and Families. I am pleased that you are joining me in Introduction to Computer Science this semester!

Course Overview:

This twelve-unit course provides an introduction to coding and computer science by way of making and design, using the revolutionary new micro:bit micro-controller board, and Microsoft's easy and powerful MakeCode block-based coding environment. The course is a project-based curriculum, with a maker philosophy at its core, that provides a context for learning coding and computer science concepts through the act of making physical objects.

The course is composed of twelve units with each focusing on specific computer science concepts and programming skills. Each unit includes three lessons that combine unplugged activities to introduce the concepts, guided or "birdhouse" activities to gain hands-on coding experience, self-directed independent projects to apply their new skills in creative ways, and assessments to test their knowledge and skill development. Teaching all twelve units and their included lessons will total approximately 22-30 hours of educator instruction/facilitation time and approximately 16-27 hours of student independent project-based activity time.

When students complete this course, they will have a good understanding of more than ten computer science concepts that can serve as the foundation for future study. They will develop powerful design skills that they can use in future projects of all types, whether they are designing 3D printed prototypes or creating apps that serve a real-world purpose.

Educators without a computer science background or who have never taught computer science before are encouraged to incorporate this course into their curriculum, regardless of their subject area, and should feel free to customize the curriculum to meet individual school or district resources and timeframe.

Classroom Procedures:

- Participation is required by all students.

Materials Needed:

- Micro:bit Kit (Supplied by school)
- Fully charged computer, headphones, pencils, paper and basic art supplies.

Course Outline:

- **Lesson 1: Making with Micro:bit**
- **Lesson 2: Algorithms**
- **Lesson 3: Variables**
- **Lesson 4: Conditionals**
- **Lesson 5: Iteration**
- **Lesson 6: Mini project**
- **Lesson 7: Coordinates**
- **Lesson 8: Booleans**
- **Lesson 9: Bits, bytes, and binary**
- **Lesson 10: Radio communication**
- **Lesson 11: Arrays**
- **Final Independent Project**

Grading Policy:

Teacher will post graded assessments in PowerSchool no later than **seven calendar days** after the student submitted the assessment. Teachers will inform students and parents in a timely fashion regarding academic progress as well when they have concerns. Teacher will grade students on their mastery of standards through assessments that include, but are not limited to quizzes, test, projects, homework assignments, labs, etc.

Teacher will enter a grade of **zero** in PowerSchool for work that is not submitted. Teacher will provide students with the opportunity to recover the recorded zero within **five school days** of the date the assignment was due. The teacher has the option of how a student can recover a zero. Teacher will deduct **10 points per day** for work submitted late.

- Classwork assigned and completed in the same period is not subject to the five-school day grace period for late submission.
- Any assignment that the teacher has graded, given feedback, recorded in PowerSchool, and returned is not subject to the five-school day grace period.

Students should make up missing assignments within **five school days** of an absence.

Students who make a choice to participate in cheating and/or not submit work after the five-school day grace period will receive a zero for that assignment. Cox Mill High School administration will assign disciplinary consequences to all students who repeatedly participate in cheating.

Grading Scale:
This course will be graded in five major areas. Below is the percentage breakdown for each component of the grading:

Classwork 20%
Projects 25%
Quizzes 20%
Homework 10%
Test 25%
Total 100%

Assignments:
Assignments are due on the assigned date and will lock after five school days. Points will be deducted for late assignments. If you are absent from class, it is your responsibility to check Canvas of a list of assignments that were covered on the day you were out. Parent contact will be made at the time you miss three assignments.

Learning assessment opportunities are provided for each unit and its associated lessons.

For more details about the assessment approach and printer-friendly versions, see the assessment guide.

- Lesson assessments: "Do now," knowledge check questions, and exit ticket
- Unit assessments: Quiz, independent project diary and rubric
- Course assessment: Final project

Performance Based Measurement:

Performance-based Measurements (PBMs), when used as the proof of learning (POL) for a course, give teachers a tool to evaluate student achievement and mastery of course concepts. A PBM measures students' ability to apply the skills and knowledge learned from course standards. Typically, the task challenges students to use their higher-order thinking skills to create a product or complete a process (Chun, 2010). PBM's look and perform differently for each course based upon the recommendations of the subject-matter experts for each course. PBMs may include a:

1. Portfolio,

2. Performance-based project – (which may include a research paper, the development of a product, a modified CTSO competitive event, and/or a presentation),

3. Skills or competency checklist, and/or

4. A combination of the above.

The selection for this course is the performance-based project.

Course Proficiency

Proficiency for this course is a weighted score of 70% or above.

PBM Specifics

Students will be asked to create an original, independent project that exhibits the use of skills they have already learned to show their knowledge of one or more concepts. Additionally, students will demonstrate new ideas for a technique, efficiency, or block that the student learned and researched independently. Students are also asked to document their learning process of building their project using an independent project framework, which emphasizes metacognitive development and process-oriented work.

During this project, students will:

● code a unique, original program demonstrating something they already know in addition to something new,

● document the details of their program code by submitting screenshot photos of comments, conditionals, the code which identifies declaring and initializing variables, and one of the following: a loop, function, or list,

● create a flowchart illustrating the program's process,

● maintain work logs of their progress, and

● reflect on their development process by using the record of thinking logs and a final narrative.

PBM Components:

50% Project code

30% Documentation

20% Reflection

Students are required to complete the PBM requirements for the course.

Internet Use:
The Internet is used for the purpose of class assignments.