MIDDLE SCHOOL | BLUE VALLEY DISTRICT CURRICULUM OVERVIEW

Code Studio

UNIT 1: Intro to Computer Science

ESSENTIAL QUESTIONS

Why is coding considered the language of the future?

BIG IDEAS

- Students understand the classroom culture of a coding class.
- Students understand how to operate in a blended learning environment.
- Students explore how computer science impacts our world.
- Students explore innovative, trending and future technologies and their applications in our lives.
- Students explore computer science careers and the impact on their current world and what may possible in the future.

GUIDING QUESTIONS

Content

- How do computers work? How has the computer changed over time? How will it change in the future?
- How are computers used to control machines/devices? How many jobs do computers help people do?
- What is computer science? How many jobs/careers are impacted by computer science?
- Why is computer science one of the most in demand jobs?
- What does the computer science workplace look like? What skills are these workplaces looking for in employers?
- How will computer science change the future? What examples are we seeing of this today? What could be next?

Process

- How can I make an impact on the future? Can computer science support this?
- How can I develop industry standard skills?
- How can looking at current jobs/careers in computer science help deepen understanding of future needs?

Reflective

- What skills are highly sought after in the computer science industry? Are these valuable for any industry?
- Why are millions of computer science jobs going unfilled? How can we change this?
- Do I understand the skills computer science builds in students? Are these skills valuable for any career?

UNIT 2: The Mindset of a Coder

ESSENTIAL QUESTIONS

How do you develop the mindset of a coder?

BIG IDEAS

- Students have opportunities to develop future ready skills which include; problem solving, perseverance, team building, collaboration, conflict resolution, communication and computational thinking.
- Students understand roles within a team setting.
- Students understand the coding class environment and the role they play.
- Students follow classroom structures developed to enhance their future ready skills. These structures include establishing teams and collaboration opportunities.
- Students understand how future ready skills translate to content.

GUIDING QUESTIONS

Content

- What skills are important for a coder?
- What are things that successful teams do?
- What does it mean to be a leader? Are there good and bad leaders?
- When working in teams, why is it important to establish norms? What is the best way for everyone on a team to have a voice? How does establishing roles create better teams?
- How does culture and environment play a role in successful classroom?
- What role does reflection play in problem solving?
- What is computational thinking? Can we use this for any problem we have in life?
- How do you create buy in on a team?
- What are some good strategies to use when you have a problem?

Process

- How does the design process play a role in problem solving?
- How can thoughts be expressed on a team without feelings being hurt?
- How can the skills I am learning be applied in other parts of my life?

Reflective

- What significant choices have been made in your team?
- Why is it important to consider multiple points of view?
- What can we learn from our failures and successes?

UNIT 3: Processes

ESSENTIAL QUESTIONS

Why do we have processes and what purpose do they serve?

BIG IDEAS

- Students collaborate in a coding environment to deepen knowledge of coding processes.
- Students explore the fundamentals of Swift.
- Students use future ready skills to navigate new learnings.
- Students problem solve and preserve through coding challenges by utilizing team members, classroom structures and supports previously established.

GUIDING QUESTIONS

Content

- What vocabulary is essential to speak the language of a coder?
- What are boot camp basics (fundamental knowledge) that help us think and create the language of coding? (Learn to code 1 provided by Swift)
    - What are commands and what purpose do they serve in coding?
    - What are sequences and what purpose do they serve in coding?
    - What is a bug and how do they impact coding?
    - What is debugging and what processes can we use to overcome the challenges it creates?
    - What is a function and what purpose do they serve in coding?
    - What is a for loop and what purpose do they serve in coding?
- What are the next level of skills that help us logically process and create code?
    - What are conditions and what purpose do they serve in coding?
    - What is boolean and what purpose do they serve in coding?
    - What are logical operators and what purpose do they serve in coding?
    - What is a while loop and what purpose do they serve in coding?
    - What is an algorithm and what purpose do they serve in coding?
    - What is pseudocode and what purpose do they serve in coding?
- How can build on our fundamental knowledge to develop more advanced coding skills? (Learn to code 2)
    - What are variables and what purpose do they serve in coding?
    - What is initialization and what purpose do they serve in coding?
    - What are parameters and what purpose do they serve in coding?
    - What are arrays and what purpose do they serve in coding?
    - How can we make connections from the real world to coding languages?

- Can I communicate my process or method for solving coding problems?
    - To an audience, team, individual
- How can I utilize my team to troubleshoot coding challenges as they arise?

Process

- What purpose do analog activities serve in learning how to code?

- Are there multiple processes to solving the same problem?
- What are good processes for handling conflict resolution? (Person to person, person to device)

Reflective

- What process works for me?
- Are processes transferable to other school subjects or even my own personal life?
- What activities helped me strengthen my understanding?
- What can I learn from observing others processes?

UNIT 4: Design

ESSENTIAL QUESTIONS

What is good design?

BIG IDEAS

- Students use the design process to create, innovate and overcome challenges.
    - Students empathize, define, ideate, prototype, test

- Students design individually, with a partner, or with a team.
- Students look at how code designs the world around us.

GUIDING QUESTIONS

Content

- What is the design process?
    - Empathize
    - Define
    - Ideate
    - Prototype
    - Test
- What does it look like to empathize?
    - Understand the way they do things and why?
    - Physical and emotional needs
    - How they think about the world
    - What is meaningful to them
- Why do we empathize?
    - Problems you are trying to solve are rarely your own
    - Observing gives you clues
    - Learn to see things with fresh set of eyes
    - Engaging people directly reveals how they think and values they hold
- How do you empathize?
    - Observe
    - Engage
    - Watch and Listen
- What does it look like to define?
    - Clarity and focus to the design space
    - Craft a meaningful and actionable problem statement
- Why do we define?
    - Results in your point of view
    - Right challenge to address
    - Synthesize your scattered findings into powerful insights
- How do we define?

    - What stood out
    - What patterns emerge
    - Understanding the user
    - Needs that are important to fulfill
    - Articulate a point of view
- What does it mean to ideate?
    - Idea generation
    - Go wide
    - Provides the fuel and source material for prototyping
- Why do we ideate?
    - Transition from identifying problems to creating solutions
    - Push for the widest possible range of ideas
    - We are not looking for the right solution here
    - Step beyond obvious solutions
    - Harness the collective perspectives and strengthen your team
    - Uncover unexpected areas of exploration
    - Create fluency and flexibility
    - Get obvious solutions out of your heads and drive team beyond them
- How do we ideate?
    - Combining conscious and unconscious mind and rational thoughts with imagination
    - Deferring judgment: separating the generation of ideas from the evaluation of ideas
    - Give your imagination and creativity a voice
    - Designate a three voting criteria then carry those forward
- What does it mean to prototype?
    - Stages to prototyping
    - Anything a user can interact with
- Why do we prototype?
    - Ideate and problem solve
    - Communicate
    - Test possibilities
    - Manage the solution-building process
- How do we prototype?
    - Start building
    - Build with user in mind
    - ID a variable
    - Don't spend too long on one prototype
- What does it mean to test?
    - Solicit feedback about prototypes
    - Opportunity to understand the user
    - Rule of thumb: always prototype as if you know you’re right but test as if you’re wrong
    - Testing is chance to refine your solutions and make them better
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- Why do we test?

  - Refine prototypes and solutions
  - Learn more about your user
  - Refine your POV
- How do we test?
  - Show don't tell
  - Create experiences
  - Ask users to compare

- Students explore how code creates the world around us and how other coding languages play a role.
  - What languages impact our world everyday?
  - What will this language allow me to design and create?

Process

- What purpose does observation serve?
- If the statement, “Actions speak louder than words” is true. Can what I observe someone doing and what they say be two different things?What does it mean if I observe what someone says and what they do are two different things?
- What is the purpose of a guiding statement?
- What are some important structures to understand when ideating?

Reflective

- How can I apply the design process to problems I have in life?
- How can using the design process help me grow as a human being?
- What can we learn from empathy?
- Can empathy help us better understand why people do what they do?
- What can you learn about yourself through prototyping?
- Did I struggle? What did I learn from my struggle?
- How can I use the design process in other classes or other parts of my life?