

Name: Nahian Sharif	Grade/Subject: Computer Science	Date: May 31, 2024
<p>1. Texas Essential Knowledge and Skills (TEKS): (C2)</p> <p>TEKS: Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms.</p>		
<p>2. Deconstructing/Unpacking the TEKS: (C2) <i>What students will know and be able to do</i></p> <p>Students will learn the definition of bug(s), debugging, critical thinking, problem solving, and decision making.</p> <p>Students will learn strategies to investigate and analyze bugs in code and find alternative solutions to create the same program without bugs.</p>		
<p>3. SMART Objective(s): (C3)</p> <p>Essential Question:</p>	<p>Smart Objective 1: By the end of the lecture, students will be able to identify and explain at least three debugging tools and techniques and demonstrate their understanding by completing an exit ticket with a score of at least 80%.</p> <p>Essential Question 1: What are the key debugging techniques we covered today, and how do they help identify and fix coding errors?</p> <p>Smart Objective 2: Given a set of programs, students will collaboratively investigate and identify at least three bugs using specific debugging techniques, and discuss the causes of these bugs in their groups, presenting their findings to the class.</p> <p>Essential Question 2: Which debugging techniques were most effective in identifying bugs in the given programs, and why?</p> <p>Smart Objective 3: Using their understanding of common bugs and debugging techniques, students will design and implement a new program that replicates the given functionality without any bugs, and verify its correctness through peer review.</p> <p>Essential Question 3: How can you apply debugging techniques to not only fix other programmers' code but also prevent similar bugs in your own coding projects?</p>	

<p>4. Central Focus (C4) <u>How will this lesson link with other lessons in the unit?</u> Learning Targets <u>I CAN statements that Clearly show alignment with TEKS</u></p>	<p>Example of Central focus usage in my class: Students will learn about increment, which means add the current number of this variable by 1. This is an important lesson that is going to be heavily used in the programming world. Specifically, the loops. Most of while, and for loop relies on increment.</p> <p>I can use the increment operator (++) to efficiently add 1 to an integer variable, demonstrating an understanding of basic programming techniques and enhancing my problem-solving skills.</p>
<p>5. Academic Language (C5)</p> <p>Academic language represents the language of the discipline that students need to learn and use to engage in the content area in meaningful ways.</p> <p>There are 4 <u>language demands</u> to consider as you require students to read, write, speak, listen, demonstrate and perform.</p>	<p>Language Function <i>(an active verb that students will use to demonstrate their learning in the assessments; some examples are- explain, describe, predict, summarize, compare, evaluate, interpret, justify):</i></p> <p>Explain the definition of technical vocabulary words related to debugging. Investigate and analyze the code to find bugs. Create similar programs without bugs. Describe the strategies used to find bugs. Discuss alternative solutions with peers. Demonstrate an understanding of debugging tools.</p> <p>Vocabulary <i>(words, phrases, and/or symbols that are used within disciplines):</i> bug(s), debugging, critical thinking, algorithm, problem solving, and decision making</p> <p>Discourse <i>(Structures of written and oral language, how will they talk, write, and participate in knowledge construction: discussions, reports, essays, multi-media presentations, performance):</i></p> <p>First, they have a basic understanding of the concept from lecture by completing exit ticket. Then they will fill the Frayer model to learn the definition of technical words. Then they will investigate and analyze the program to find bugs. Then they discuss the bugs with their peers. Then they create another program without bugs.</p> <p>Syntax <i>(The set of conventions for organizing symbols, words, and phrases together into structures, e.g., graphic organizers, formulas, charts, language rules, outlines, graphs, tables):</i></p> <p>Students will use the Frayer Model to organize and define technical vocabulary words. They will create flowcharts to visually represent the steps and logic of their bug-free programs. Additionally, they will create graphic organizers to outline and compare different debugging strategies discussed in class.</p>

6. Targeted Language Supports (C5)

The resources, representations, and strategies you will provide to help students understand, use, and practice the concepts and language they need to learn within the discipline

Site the researcher's name as you refer to the strategy.

Language Function (*How will you help them demonstrate the DO verb?*)

Students will **EXPLAIN** the definitions of bugs, debugging, critical thinking, problem solving, and decision making through class discussions and written summaries.

Students will **INVESTIGATE** and **ANALYZE** the identified bugs by discussing their causes and effects with peers in small group sessions.

Students will **CREATE** new, bug-free versions of the given programs by applying debugging strategies in coding assignments.

Students will **DESCRIBE** the debugging strategies they used and their thought process in written reports and verbal presentations.

Students will **DISCUSS** alternative solutions and strategies with their peers during collaborative group activities and peer review sessions.

Vocabulary Strategies - (GO TO Page)

1. Frayer Model: I believe Frayer model's 4 square is important. I want them to not just learn the definitions, but write examples, drawing, and characteristics of the technical words. These extra steps will allow students to know where will these words be used.

2. Indirect Learning of Vocabulary: I believe using the words in real life situations will allow students to see the importance of these words. When they become curious, then I give Frayer model to let them completely understand the word.

Discourse strategies - (GO TO Page)

-Write: Students will use these words in their Frayer model, Exit ticket, and in discussions.

-Talk: Students will mention these words after they finished their investigation and discuss their bugs finding with peers.

Syntax - (GO TO Page)

1. Graphic Organizers: Students use graphic organizers such as flowcharts and diagrams to help students visually map out their debugging process and strategies. This will help them organize their thoughts and understand the logical flow of their programs.

2. Tables and Charts: Students use tables and charts to categorize and compare different types of bugs and debugging strategies. This helps in organizing information in a structured manner.

Making Content Comprehensible (R9)

<p>7. Assessment/ Evaluation (C6) Assessment(s) must be aligned to the TEKS, and objectives.</p>	<p>Assessment of your TEK Formative: Using anonymous voting data, I can determine if students are ready to move forward or if there are areas that need clarification. This allows students to ask questions and clarify topics they are unsure about. This approach provides immediate feedback on students' understanding and allows for adjustments in teaching methods if necessary.</p> <p>Summative: I will be able to assess their understanding and performance by looking at the exit ticket, newly created, bug-free program, discussions, and usage of the strategies.</p> <p>Assessment of your language demands: Formative: With the anonymous voting data, I can see if I can move forward or I allow students to ask questions and clarify topics that they want.</p> <p>Summative: Students will write reports explaining the debugging strategies they used, describing their thought process, and reflecting on what they learned. They will discuss their findings with their group and gain feedback. These methods will provide a detailed understanding of students' language mastery by evaluating their ability to articulate their thoughts and strategies both in written and oral forms.</p>
<p>8. Hook (C7)</p> <p>Closure (C7)</p> <p>Student Assets (C7)</p>	<p>Hook activity (<i>make connections to prior learning</i>) For computer science students, I believe fun-facts about program used in physics, engineering, and astronomy will make students curious. These facts will be aligned with current objectives.</p> <p>Closure Activity: (<i>make connections to prior learning</i>) I believe exit ticket, quick doodles, and credit card technique will motivate my students to complete the closure. Participation grades will be available.</p> <p>Personal assets: background knowledge students already learned from past experience, family background, and from interest. Cultural assets: background knowledge from their home country, history, traditions, and arts. Community assets: Knowledge gained from community events, neighborhood, and resources.</p>

<p>9. Body of Lesson/ Teaching Strategies and Learning Task(s) (C9)</p> <p>Be sure to include: How will students learn and use <i>academic language</i>?</p> <p>Three higher order thinking questions.</p> <p>Marzano Strategy</p>	<p>I DO – I do the creation of lesson plans and execute them by lecturing, take and analyze various assessments, giving assignments, and group tasks to ensure students success.</p> <p>WE DO – We do the respect for each other, communicate, and make sure that objectives are achieved.</p> <p>YOU DO – You do the completion of task, participate in activities, ensure that you are successful and ask for help.</p> <p>Differentiation-(GO TO page) <i>(Tailoring instruction to meet individual needs; differentiating the content, process, product, and/or learning environment):</i></p> <ul style="list-style-type: none"> Second Language learners / Cultural Diversity: Tiered Instruction will work best for ESL students. They will be quick to understand the objective if I break it into 3 parts and use basic words. Gifted / advanced learners: Flexible Grouping is going to help students motivate to do better and feel great about their accomplishments. <p>Technology: -(GO TO page) The technologies I plan to use are Microsoft Teams, Discord, IDE for programming, and Kahoot.</p> <p>Marzano Strategy - (GO TO page)</p> <p>Cooperative Grouping: instructional strategies used by teachers to help students become independent, strategic, learners.</p> <p>Graphic organizers: It helps organizing and understanding the information.</p> <p>Higher Order Thinking Questions (GO TO page)</p> <ol style="list-style-type: none"> 1. Can you explain what might happen after we run this line of code? 2. Describe what does ++ mean in front of the integer variable. 3. Create a flowchart for a program that calculates a letter grade based on 3 exams' result. <p>Grouping / Partnering Technique: (Hattie) Small groups, Kagan Cooperative Learning, and Rally Robin.</p> <p>Potential misconceptions and your plan to address it: Computer science is using English language, but the symbols have different meaning. As a new programmer, my students will find the writing style, syntax, and programming punctuations confusing. I plan to use flash cards, Frayer's model, and have vocabulary quiz to ensure that students memorized the writing style, syntax, and programming punctuations.</p>
<p>10. Resources and materials needed (C9)</p> <p>(E7)</p>	<p><i>(How might you differentiate materials and resources for learners with various needs?)</i> Paper, Pen/pencil, and computer.</p> <p>Screen reading software, apps for reminders or notetaking.</p>
	<p>SUBMIT LPG and SELF EVALUATION RUBRIC – C9</p>

<p>11. Classroom Management Strategies (CBM5)</p> <p><i>What procedures will you employ to manage transitions, behavior, passing out materials, engagement, etc.?</i></p> <p><i>Add 3 procedures</i></p>	<p>Procedures 1: Read the objectives on board.</p> <p>Procedures 2: Stay silent during lectures</p> <p>Procedures 3: Participation</p>
<p>12. Academic Supports for Students (E6)</p> <p><i>What instructional strategies and planned supports, will you employ to meet the needs of each student that has identified special learning needs?</i></p> <p>(E11)</p>	<p>Accommodation(s)- <i>(A change that helps a student overcome or work around obstacles):</i></p> <ol style="list-style-type: none"> 1. Level of support 2. Output 3. Difficulty <p>Modification(s)- <i>(A change in what is being taught or what is expected from the student):</i></p> <ol style="list-style-type: none"> 1. Quantity 2. Time 3. Input <p>Strategies for ELLs <i>(strategies that support language acquisition)</i></p> <ol style="list-style-type: none"> 1. Label items in your classroom to help students learn vocabulary words. 2. Arrange group work. This help ELL practice. 3. Graphic organizers 4. Encourage them to read aloud 5. Study and be aware of cultural differences.

DELIVERY PLAN

1. **Objective (Rigor)** - SMART and should be visible on your board daily.

Concept definition map: Advance concept like while loop & for loop can be describe using concept definition map like flow charts
Cloze sentences: Example: “When we use _____ (Incrementation), we add 1 to the value of a number variable”.
Word Generation: A **logic operator** is like a traffic light at an intersection, directing the flow of cars based on specific rules. Just as a red light stops traffic and a green light allows it to go, **logic operators** control the flow of information in a program based on true or false conditions.

2. **Opening (Retrieval)** – How will you "hook" your students into the lesson--at both the thinking and emotional level?

- What will you do to open the lesson to motivate and engage the students’ interest in the content?
- How will you help students make connections to prior knowledge?
- How will you identify and present your essential questions, Central focus, and Learning Targets (I CAN statements)?
- How will you identify / teach / assess language demands?
- How will you introduce language support?
- Is your opening congruent to the objective?
 1. I will start the lecture with an interesting fact.
 2. Computer science is when you can see the logic. I would use real life examples to show the logic, and connect that logic with lessons.
 3. I will align essential questions with core concepts of the curriculum. Central focus will be presented by outlining the topics we explore. I will show the I can statements for each lessons on board like "I can explain how algorithms solve problems".
 4. I will create a reading day where students read about the new topic in an article, fill out KWL chart, and have small group discussions. I will pay attention to students in their small group discussion activities. And I will analyze the KWL chart to assess their reading skills.
 5. Label items in the classroom to help students learn vocabulary words. Arrange group work to help ELL students practice their language skills. Use graphic organizers to visually support learning. Encourage students to read aloud to improve their language proficiency. Study and be aware of cultural differences to create an inclusive and supportive environment.
 6. Yes, my opening is congruent with the objective of being a high school intro to computer science teacher. By labeling classroom items, arranging group work, using graphic organizers, encouraging reading aloud, and understanding cultural differences, I create a supportive learning environment that aligns with the goal of effectively teaching computer science concepts to all students.

3. **Teacher Input (Relevance)** – What information is needed for the students to gain the knowledge/skill in the objective? (Be sure you have done a task analysis to break the information/skill into small manageable steps). How will you use strategies, technology, learning styles? What vocabulary and skills do the students need to master the material? Are the strategies you plan to use congruent to the objective?

Students will use **LOGIC OPERATOR** in the conditional statement (Upcoming lesson). I will use Frayer's model to let students master these operators. Vocabulary words are AND, NAND, OR, and NOR. Critical and logical thinking skills are necessary. Yes, these strategies are congruent and assist students complete the objective.

- **Model (Routing)** – Outline your **I DO** activities. Be sure to model strategies and academic language supports needed.

I DO – I do the creation of lesson plans and execute them by lecturing, take and analyze various assessments, giving assignments, and group tasks to ensure students success.

- **Guided Practice** – Students demonstrate a grasp of new learning under the teacher's direct supervision. The teacher moves around the room to provide individual remediation as needed. "Praise, prompt, and leave" is an excellent strategy to use. Outline your **WE DO** activities. Be sure to incorporate strategies and academic language supports that are needed.

WE DO – We do the respect for each other, communicate, and make sure that objectives are achieved.

- **Independent Practice (Retaining/Rehearsing)** – Students demonstrate an independent application of a new skill. Outline your **YOU DO** activities. Students demonstrate an independent application of new skill. Be sure to praise and assess strategies and academic language supports that are being used.

YOU DO – You do the completion of task, participate in activities, ensure that you are successful and ask for help.

- **Check for Understanding (Recognizing)** – Practice doesn't make perfect; it makes permanent. So, make sure the students understand how to proceed before moving to the practice phase of the lesson. You may need to stop and reteach, so students practice correctly. How do you plan to assess understanding? **What HOTQs will you ask?** List at least 3

1. Can you explain what might happen after we run this line of code?
2. Describe what does NAND mean. Give me an example.
3. Create a flowchart for a program that calculates a letter grade based on 3 exams' result.

- **How will you check for understanding or reteach?**

Exit ticket, quick doodles, and credit card technique will motivate my students to complete the assignment because of the participation grade. I will collect data from these assignments and see if students understood the topic correctly. If so, then we move to the next stage. If not, then we review and work on the struggling part of the topic and then move forward.

4. **Assessment** – How will we know that the students have individually mastered the objective? What evidence will be collected? What will be an acceptable score? What evidence will be collected to demonstrate mastery of language demands?

Exit ticket, quick doodles, and credit card technique will motivate my students to complete the assignment because of the participation grade. The grade must be above 85% to 90%. This shows that they have understood the topic. These assignments will be constructed in a way that uses direct information from the lecture. So, students who is paying attention can easily achieve the desired grade.

5. **Resources** - What materials will you need for a successful lesson?

Paper, Pen/pencil, and computer.

Screen reading software, apps for reminders or notetaking.

6. **Closure (Re-exposure)** – How will you have the students end the lesson/reflect upon what was learned?

I believe exit ticket, quick doodles, and credit card technique will motivate my students to complete the closure. Participation grades will be available.

NOTES:

Reading day:

Give student KWL chart, introduce the new topic in few minutes, let them fill out the K & W section of the chart, Let them read for 20 minutes, fill the L section, have a small group discussions

Lecture day:

Start with interesting facts, ask questions and check on students during the lecture. Have small group discussions and fill out the exit ticket.

Assignment day:

Introduce instructions, give them work, walk around to see if anyone needs help, when they are done, let them have small group discussions about their answers.