



Middle School CTE Program

*Design/Engineer Thinking
Sample Lesson & Activity*





Welcome

Dear Teachers,

Thank you so much for joining us! It is a pleasure to meet you, and welcome you to our new middle school CTE program.

Do your students have dreams for their futures? Do they know what opportunities are out there that we don't even know yet? Their options are broad and limitless, and our goal is to start introducing students to their interests and passions for a future full of possibilities.

Included in this Teachers' Guidebook are lessons, helpful hints, learning resources, and assignments. We provide everything you need to easily facilitate this course whether you are in the classroom or distance learning.

Kindly,

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Sr. Director of Curriculum & Instruction

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The Design Process

REFLECT

Publish your creation, gather feedback, and refine again.



ASK QUESTIONS

to understand what you are teaching and your constraints.



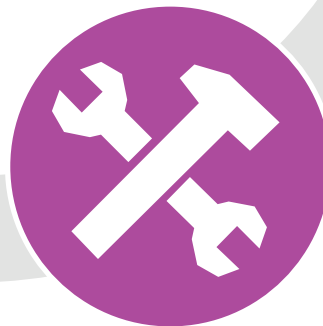
CREATE

to quickly brainstorm ideas (it doesn't matter if they are good or bad ideas).



PROTOTYPE

and design creations using your best brainstormed idea (to start).



TEST

Does your prototype work? What needs to be changed? Do you need to start over with a new prototype?



What is Design?

Essential Question: How important is the design process to creativity?

- Key Vocabulary :**
- Design process
 - Creativity
 - Systems
 - Board game

- Materials:**
- Design journal (blank, unlined notebook for note taking and sketching)
 - Pencils/pens
 - Projector/smart board/Virtual learning room (like Zoom)
 - Chart paper or whiteboard and markers or virtual whiteboard

- Lesson Objectives:**
- Understand the basics of the design process
 - Begin to use key terminology associated with the design process and game design



Introduction

Whole group discussion: Teacher will kick off the lesson with his or her own version of the following discussion:

"Today we will begin our work and study in the field of using the design process to create games. What is the design process? Do you have any personal experiences with creating new things using a system that requires you to revise and edit until you are ready to share your creation? Do you think this process relates to STEM work?"

Record students' answers on chart paper or digital whiteboard.

RESOURCES:

- Kneoworld *handout: What is the Design Process?*
- Kneoworld's *learning video: The Design Process is like Planting a Garden.*
- *Teacher-made sample of board game or student sample from a previous class.*

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Launch

Show KneoWorld's Video: "The Design Process is like Planting a Garden."

Ask students if they have thought of anything new to add to the list you co-created during the introduction, and record their answers.

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Task

Whole Group:

Explain to the students that today they will start their first project, creating a board game with the United Nation's Sustainable development goal: Good Health and Well-Being. The students will work in groups of 2-3 and will solve the challenge of creating a board game that is easy enough for 5 year old children to play, and fun for adults too. Show a sample, made by a teacher, or student from a previous class. Ask the students what they notice about the sample game:

- Is it easy to understand?
- What kinds of parts are there to the game
- Is there a winner?
- Would you like to play this game?

In small groups:

Have students start to create. Encourage the students to try to use steps from the design process to create their game. Explain they will have the rest of the week to work on and finish their board game design. Provide the groups with the following questions to help guide their design:

1. What will you make?
2. What will the rules be?
3. How will you win?
4. How will you make it fun?
5. What will you do to engage the players?
6. Will there be a theme?
7. Don't be afraid to make mistakes (you can fix them).

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Reflection

At the end of the class session (or for homework) ask students to record the vocabulary words and definitions in their journals. Remind them to find the definitions for the words that make most sense within the context of creating designs and game design.

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Closing

Ask each group of students to provide a quick 2-3 minute description of their game so far. If the whole group has feedback to share, encourage them to share their ideas with the group. This is a quick process, give each group a maximum of 3 minutes to present and then a maximum of 3 minutes for feedback.

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Additional Notes:

Ask students to record notes and vocabulary in their journals.

Journals may also be used any time during the class for the students to sketch, brainstorm, or write down ideas for future projects.

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Assessment

Board Game