



# Park Hill School District

Building Successful Futures • Each Student • Every Day

## High School Design Thinking Curriculum

**Course Description:** The Design thinking course is meant to help students develop an ideology and mindset that can be used as a process to approach learning, problem solving, innovation, and creative works in realistic ways. It is centered around the process of: Empathy, Definition, Ideation, Prototyping, Testing, Implementing, and Reflection. The goal of the course is to teach students this process and to use it in their coursework, to help solve problems, in their creative endeavors, and in their everyday lives.

### Scope and Sequence:

| Timeframe  | Unit                          | Instructional Topics  |
|------------|-------------------------------|---|
| 1 semester | Design Thinking Mechanics     | Topic 1: Understand<br>Topic 2: Explore<br>Topic 3: Materialize |
| 1 semester | Design Thinking Demonstration |   |

## Unit 1: Design Thinking Mechanics

**Subject:** Design Thinking

**Grade:** 9-12

**Name of Unit:** Design Thinking Mechanics

**Length of Unit:** 1 semester

**Overview of Unit:** During this unit, students explore the 7-phase process of design thinking first through small challenges, and eventually through larger-scale opportunities. Students will learn the phases of design thinking and how to apply them to their own projects. Engaging scenarios in this unit start with small design challenges and culminate in students choosing from a menu of ideas.

### **Priority Standards for unit:**

- 9-12.ETS1.B.1 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
- DESE.W.1A.9-10 Conduct research to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; gather multiple relevant, credible sources, print and digital; integrate information using a standard citation system. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
- DESE.W2.A.9-10 Follow a writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the task, purpose, and audience; self-select and blend (when appropriate) previously learned narrative, expository, and argumentative writing techniques.
- DESE.SL1.A.9-10 Work with peers to set rules for collegial discussions and decision-making, clear goals, deadlines, and individual roles as needed.
- DESE.SL1.B.9-10 Delineate a speaker's argument and claims, evaluating the speaker's point of view, reasoning, and evidence in order to propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
- DESE.SL1.C.9-10 Respond thoughtfully to diverse perspectives including those presented in diverse media, summarize points of agreement and disagreement, resolve contradictions when possible, and determine what additional information or research is needed.

- DESE.SL2.A.9-10 Speak audibly and to the point, using conventions of language as appropriate to task, purpose, and audience when presenting including appropriate volume, clear articulation, and accurate pronunciation at an understandable pace, avoiding verbal filler that might be distracting to listeners.
- DESE.SL2.B.9-10 Make consistent eye contact with a range of listeners when speaking, using effective gestures to communicate a clear viewpoint and engage listeners; avoid body language or mannerisms that might be distracting to the audience.
- DESE.SL2.C.9-10 Plan and deliver appropriate presentations concisely and logically based on the task, audience, and purpose making strategic use of multimedia in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- ISTE - INNOVATIVE DESIGNER.4.A - know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- ISTE - INNOVATIVE DESIGNER.4.C - develop, test and refine prototypes as part of a cyclical design process.
- ISTE - CREATIVE COMMUNICATOR.6: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
- TT.AB.D.9: Students will respond to diversity by building empathy, respect, understanding and connection.
- TT.AB.J.11: Students will recognize stereotypes and relate to people as individuals rather than representatives of groups.

#### **Supporting Standards for unit:**

- 9-12.ETS1.A.2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- 9-12.ETS1.B.2 Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
- ISTE - KNOWLEDGE COLLECTOR.3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
- ISTE - INNOVATIVE DESIGNER.4.B - select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- ISTE - INNOVATIVE DESIGNER.4.D - exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
- ISTE - COMPUTATIONAL THINKER.5: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

- ISTE - GLOBAL COLLABORATOR.7: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
- TT.AB.I.4: Students will express pride, confidence and healthy self-esteem without denying the value and dignity of other people.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- TT.AB.D.8: Students will respectfully express curiosity about the history and lived experiences of others and will exchange ideas and beliefs in an open-minded way.

| <b>Unwrapped Concepts<br/>(Students need to know)</b>   | <b>Unwrapped Skills<br/>(Students need to be able to do)</b> | <b>Bloom's<br/>Taxonomy<br/>Levels</b> | <b>Webb's<br/>DOK</b> |
|---|--|--|-----------------------|
| A solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. | Evaluate   | Synthesize                             | 3                     |
| Research to answer a question or solve a problem  | Conduct  | Apply                                  | 2                     |
| The inquiry when appropriate  | Narrow   | Apply                                  | 2                     |
| The inquiry when appropriate  | Broaden  | Apply                                  | 2                     |
| Multiple relevant, credible sources, print and digital  | Gather   | Apply                                  | 2                     |
| Information using a standard citation system  | Integrate  | Apply                                  | 3                     |
| Relevant information from multiple authoritative print and digital sources  | Gather   | Apply                                  | 2                     |
| Advanced searches effectively   | Use  | Apply                                  | 2                     |
| The usefulness of each source in answering the research question  | Assess   | Evaluate                               | 3                     |

|  |                       |            |   |
|--|-----------------------|------------|---|
| Information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation  | Integrate             | Synthesize | 3 |
| A writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the task   | Follow                | Apply      | 3 |
| A writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the purpose  | Follow                | Apply      | 3 |
| A writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the audience   | Follow                | Apply      | 3 |
| Previously learned narrative writing techniques  | Self-select and blend | Apply      | 3 |
| Previously learned expository writing techniques   | Self-select and blend | Apply      | 3 |
| Previously learned argumentative writing techniques  | Self-select and blend | Apply      | 3 |
| With peers to set rules for collegial discussions and decision making  | Work                  | Apply      | 2 |
| With peers to set rules for clear goals  | Work                  | Apply      | 2 |
| With peers to set rules for deadlines  | Work                  | Apply      | 2 |
| With peers to set rules for individual roles   | Work                  | Apply      | 2 |
| A speaker's argument and claims  | Delineate             | Synthesize | 3 |
| The speaker's point of view, reasoning, and evidence in order to propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas | Evaluate              | Evaluate   | 4 |

|  |                      |            |   |
|--|----------------------|------------|---|
| Others into the discussion   | Actively incorporate | Apply      | 2 |
| Ideas and conclusions  | Clarify              | Understand | 2 |
| Ideas and conclusions  | Verify               | Understand | 2 |
| Ideas and conclusions  | Challenge            | Understand | 2 |
| Thoughtfully to diverse perspectives including those presented in diverse media  | Respond              | Understand | 2 |
| Points of agreement and disagreement   | Summarize            | Analyze    | 2 |
| Contradictions when possible   | Resolve              | Understand | 2 |
| What additional information or research is needed  | Determine            | Understand | 2 |
| Audibly and to the point, using conventions of language as appropriate to task, purpose, and audience when presenting, including appropriate volume, clear articulation, and accurate pronunciation at an understandable pace, avoiding verbal filler that might be distracting to listeners | Speak                | Apply      | 1 |
| Consistent eye contact with a range of listeners when speaking.  | Make                 | Apply      | 2 |
| Effective gestures to communicate a clear viewpoint and engage listeners.  | Use                  | Apply      | 2 |
| Body language or mannerisms that might be distracting to the audience  | Avoid                | Apply      | 2 |
| Appropriate presentations concisely and logically based on the task, audience, and purpose, making strategic use of multimedia in presentation to enhance understanding of findings, reasoning, and evidence and to add interest   | Plan                 | Apply      | 3 |

|  |             |            |   |
|--|-------------|------------|---|
| Appropriate presentations concisely and logically based on the task, audience, and purpose, making strategic use of multimedia in presentation to enhance understanding of findings, reasoning, and evidence and to add interest | Deliver     | Apply      | 3 |
| A deliberate design process for generating ideas, testing theories, creating innovate artifacts, or solving authentic problems   | Know        | Understand | 2 |
| A deliberate design process for generating ideas, testing theories, creating innovate artifacts, or solving authentic problems   | Use         | Apply      | 2 |
| Prototypes as a part of a cyclical design process  | Develop     | Apply      | 3 |
| Prototypes as a part of a cyclical design process  | Test        | Apply      | 3 |
| Prototypes as a part of a cyclical design process  | Refine      | Apply      | 3 |
| Clearly  | Communicate | Apply      | 2 |
| Creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals   | Express     | Apply      | 2 |
| To diversity by building empathy, respect, understanding, and connection   | Respond     | Apply      | 2 |
| Stereotypes  | Recognize   | Understand | 1 |
| To people as individuals rather than representatives of groups   | Relate      | Apply      | 2 |

### **Essential Questions:**

1. How are the perspectives and/or experiences of other people integral in the design thinking process?
2. What questions do students need to ask and answer in order to understand the content (i.e., depth, context, working knowledge) and user needs (i.e., criteria, constraints). How will students use their findings to create possible solutions?
3. How do students generate and refine ideas for problems they are working on?

4. How will students engage in iterative steps toward self-directed, responsible critical thinking demonstrations ensuring progress towards the formation of a resolution, conclusion, and/or solution of their potential question(s)?
5. How will students engage in data collection, testing, and/or experimentation in order to gain feedback concerning their prototypes?
6. How do students analyze, synthesize, and then utilize feedback provided from end users to improve their processes and products?
7. How do students put their ideas (finalized resolutions, conclusions, and/or solutions) out into the real world for consumption and/or implementation?

**Enduring Understanding/Big Ideas:**

1. Empathy (Understand): Students will understand that critical thinking, research, and problem solving all begin with the noticing of problems or curiosities from looking around oneself, listening to those involved with and influenced by the problems that exist in the world, learning about the perspectives and points of view on how to solve those problems and how these problems directly impact the human being.
2. Define (Understand): Students develop knowledge through inquiry and a variety of research methods. Students use this knowledge as a base from which to work on ambiguous problems. Students will exhibit tolerance for working with ambiguity and open-endedness. They will define criteria and constraints for themselves. Problem definitions can come from various sources, both prescriptive from a teacher or community partner, or student-generated through personal curiosity, discovery and passion.
3. Ideate (Explore): Students will generate ideas through brainstorming. Students will think expansively to spark visionary thoughts and ideas for a variety of methodologies, approaches, and/or solutions to real world problems. Students will use a series of divergent and convergent thinking strategies in the brainstorming process to further generate and refine ideas.
4. Prototype (Explore): Students will plan, outline, map, and/or create a product based upon a selected/preferred ideation moving towards the end goal. This process is informed initially and consistently by results from Empathy, Define and Ideate stages. Prototyping is inherently about failure and a growth mindset, continuously improving a product or process.
5. Test (Materialize): Students will test, experiment, and share initial design(s)/latest prototype(s) with end user in order to gain additional insight and feedback on a subsequent design to be launched.
6. Reflect (Materialize): Following the testing, experimenting, and sharing of design, students will reflect upon a variety of feedback focusing on both process and product.



7. Implement (Materialize): Students will share/transmit/launch their findings, creations, and products with others in various formats, and will reflect on their process, outcomes, and the reception of their ideas.

**Unit Vocabulary:**

| Academic Cross-Curricular Words  | Content/Domain Specific |
|--|-------------------------|
| Design Thinking<br>Empathy<br>Define<br>Ideate<br>Prototype<br>Test<br>Implement<br>Reflection<br>Feedback | Iterate                 |

**Resources for Vocabulary Development:**

“Launch” - John Spencer and AJ Juliani

Design thinking for Educators 2nd Edition (<https://designthinkingforeducators.com/> )

Stanford D. School (<https://dschool.stanford.edu/>)

Nilson and Norman Group (<https://www.nngroup.com/articles/design-thinking/>) article & graphics

Designer’s Workbook - Riverdale IDEO (<https://www.ideo.com/post/design-thinking-for-educators> )

## Engaging Scenario--First days of school

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

Day 1 (½ day) - Introduction to design thinking. Students will complete 2 quick design challenge experiences.

1. Gumdrop Challenge: Students will work to build a structure using only gumdrops and toothpicks. The structure must hold a book or laptop device for 30 seconds. The exact specifications for the requisite height, number of gumdrops and guidelines for building the structure may be determined by the participants.
2. Roller Coaster Challenge: students will design a marble roller coaster using supplies such as: paper plates, tape, string, paper, popsicle sticks, and other materials. Students will need to name (brand) their coaster and produce a 30 second presentation selling the features of their coaster.

Day 2 (½ day) - Extended design thinking challenge. Students will complete 1 moderate length design challenge experience.

1. Pinball Machine: Students will work in teams to design, create and pitch a pinball machine made of materials like cardboard, tape, plastic, balloons, etc. Students may focus the design on player experience, game theme, pinball mechanics, scoring, etc. Specific criteria and constraints for the pinball machines may be defined by the teacher prior to the experience, or decided upon by the classroom during the experience with teacher input.

Day 3 (½ day) - Designing with the user in mind design challenge. Students will be paired with a classmate and will design an item for their partner. They will work with their partner to agree upon a chosen area of design to work on from the following categories; city design, mobile app design, board game design, superhero costume design. With instructor guidance, the group will develop an initial interview protocol to help the pairs agree upon a design challenge. Students will then develop an interview protocol on their own to ask their partner questions to help in designing for them. After conducting interviews students will then ideate, prototype, test, and implement their designs. The culmination will be presentations to the group and a reflection upon the process.

Day 4 (½ day) - Culture Design Launch. Students will complete a Socratic seminar on bias and discrimination based on the reading of articles and viewing of video clips (Danger of a Single Story, Jane Elliot's brown-eyed/ blue-eyed classroom experiment). Students will then conduct the Human Number Line activity from the AVID CRT book. This will be followed empathy interviews with peers, parents, and staff members around what others want in a school culture. This will form the basis for launching into the quarter 1 school culture design challenge.

## Engaging Scenario--For Quarter 1

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

### Building our own Culture

Problem/Question: What should the culture of the LEAD Innovation Studio look like? Why is this culture an important part in making you successful as a person as well as making all of us successful as a team?

Project Goal: Teams will create multimedia presentations concerning their overall plans and ideas concerning what they believe the culture of the LEAD Innovation Studio should look like. The presentation should be well rehearsed and a length of 5-7 minutes, in a sales-pitch persuasive style.

## Topic 1: Understand



### **Engaging Experience 1**

**Title:** Empathy - Look, Listen, and Learn

**Suggested Length of Time:** 1 day

#### **Standards Addressed**

##### *Priority:*

- DESE.W.1A.9-10 Conduct research to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; gather multiple relevant, credible sources, print and digital; integrate information using a standard citation system. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
- DESE.W2.A.9-10 Follow a writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the task, purpose, and audience; self-select and blend (when appropriate) previously learned narrative, expository, and argumentative writing techniques.
- DESE.SL1.A.9-10 Work with peers to set rules for collegial discussions and decision-making, clear goals, deadlines, and individual roles as needed.
- TT.AB.D.9: Students will respond to diversity by building empathy, respect, understanding and connection.
- TT.AB.J.11: Students will recognize stereotypes and relate to people as individuals rather than representatives of groups.

##### *Supporting:*

- ISTE - KNOWLEDGE COLLECTOR.3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
- ISTE - GLOBAL COLLABORATOR.7: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
- TT.AB.I.4: Students will express pride, confidence and healthy self-esteem without denying the value and dignity of other people.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- TT.AB.D.8: Students will respectfully express curiosity about the history and lived experiences of others and will exchange ideas and beliefs in an open-minded way.

**Detailed Description/Instructions:** Students learn to conduct empathy interviews, conduct information gathering surveys, and utilize other methods of investigating multiple perspectives on issues and problems.

**Bloom's Levels:** Apply

**Webb's DOK:** 3



### **Engaging Experience 2**

**Title:** Define - Asking questions, researching, and creating knowledge

**Suggested Length of Time:** 1 day

#### **Standards Addressed**

##### *Priority:*

- DESE.W.1A.9-10 Conduct research to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; gather multiple relevant, credible sources, print and digital; integrate information using a standard citation system. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
- DESE.W.2.A.9-10 Follow a writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the task, purpose, and audience; self-select and blend (when appropriate) previously learned narrative, expository, and argumentative writing techniques.

##### *Supporting:*

- ISTE - KNOWLEDGE COLLECTOR.3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
- TT.AB.I.4: Students will express pride, confidence and healthy self-esteem without denying the value and dignity of other people.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- TT.AB.D.8: Students will respectfully express curiosity about the history and lived experiences of others and will exchange ideas and beliefs in an open-minded way.

**Detailed Description/Instructions:** Students will conduct research into what defines culture and how it affects a person socially, psychologically, and their growth potential.

**Bloom's Levels:** Apply

**Webb's DOK:** 3

## Topic 2: Explore



### **Engaging Experience 1**

**Title:** Ideate - Planning and Failing Forward

**Suggested Length of Time:** 1 day

#### **Standards Addressed**

##### *Priority:*

- 9-12.ETS1.B.1 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
- DESE.SL1.C.9-10 Respond thoughtfully to diverse perspectives including those presented in diverse media, summarize points of agreement and disagreement, resolve contradictions when possible, and determine what additional information or research is needed.
- ISTE - INNOVATIVE DESIGNER.4.A - know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- TT.AB.D.9: Students will respond to diversity by building empathy, respect, understanding and connection.

##### *Supporting:*

- 9-12.ETS1.A.2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- ISTE - INNOVATIVE DESIGNER.4.D - exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
- TT.AB.I.4: Students will express pride, confidence and healthy self-esteem without denying the value and dignity of other people.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

**Detailed Description/Instructions:** Students will create an outline of all structures and/or processes they believe are necessary in forming their version of the “perfect” LEAD Innovation Studio culture based upon their research and empathy interviews.

**Bloom’s Levels:** Synthesize

**Webb’s DOK:** 3

## **Engaging Experience 2**



**Title:** Prototype - Try, Create, and Play

**Suggested Length of Time:** 1 day

### **Standards Addressed**

#### *Priority:*

- 9-12.ETS1.B.1 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
- ISTE - INNOVATIVE DESIGNER.4.A - know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- ISTE - INNOVATIVE DESIGNER.4.C - develop, test and refine prototypes as part of a cyclical design process.

#### *Supporting:*

- 9-12.ETS1.A.2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- 9-12.ETS1.B.2 Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
- ISTE - INNOVATIVE DESIGNER.4.D - exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
- ISTE - COMPUTATIONAL THINKER.5: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

**Detailed Description/Instructions:** Students will begin to create representations (i.e., drawings, blueprints, outlines, etc.) of products necessary for cultural “icons/elements” (i.e., flags, shirts, traditions, songs, etc.) to use for representation of their ideations and proposals.

**Bloom’s Levels:** Create

**Webb’s DOK:** 4

## Topic 3: Materialize



### **Engaging Experience 1**

**Title:** Test - Experiment, Feedback, and Revision

**Suggested Length of Time:** 1 day

#### **Standards Addressed**

##### *Priority:*

- 9-12.ETS1.B.1 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
- DESE.SL1.B.9-10 Delineate a speaker's argument and claims, evaluating the speaker's point of view, reasoning, and evidence in order to propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
- DESE.SL1.C.9-10 Respond thoughtfully to diverse perspectives including those presented in diverse media, summarize points of agreement and disagreement, resolve contradictions when possible, and determine what additional information or research is needed.
- DESE.SL2.A.9-10 Speak audibly and to the point, using conventions of language as appropriate to task, purpose, and audience when presenting including appropriate volume, clear articulation, and accurate pronunciation at an understandable pace, avoiding verbal filler that might be distracting to listeners.
- DESE.SL2.B.9-10 Make consistent eye contact with a range of listeners when speaking, using effective gestures to communicate a clear viewpoint and engage listeners; avoid body language or mannerisms that might be distracting to the audience.
- DESE.SL2.C.9-10 Plan and deliver appropriate presentations concisely and logically based on the task, audience, and purpose making strategic use of multimedia in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- ISTE - INNOVATIVE DESIGNER.4.C - develop, test and refine prototypes as part of a cyclical design process.

##### *Supporting:*

- TT.AB.I.4: Students will express pride, confidence and healthy self-esteem without denying the value and dignity of other people.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.



- TT.AB.D.8: Students will respectfully express curiosity about the history and lived experiences of others and will exchange ideas and beliefs in an open-minded way.

**Detailed Description/Instructions:** Students will take their developed ideations from prototypes and create them into working models, documents, products, etc., and present them to sample shareholders within the LEAD Innovation studio to collect feedback for analysis and revision.

**Bloom's Levels:** Create

**Webb's DOK:** 3



## **Engaging Experience 2**

**Title:** Implementation - Present, Show, and Reflect

**Suggested Length of Time:** 1 day

**Standards Addressed**

*Priority:*

- DESE.SL1.B.9-10 Delineate a speaker's argument and claims, evaluating the speaker's point of view, reasoning, and evidence in order to propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
- DESE.SL1.C.9-10 Respond thoughtfully to diverse perspectives including those presented in diverse media, summarize points of agreement and disagreement, resolve contradictions when possible, and determine what additional information or research is needed.
- DESE.SL2.A.9-10 Speak audibly and to the point, using conventions of language as appropriate to task, purpose, and audience when presenting including appropriate volume, clear articulation, and accurate pronunciation at an understandable pace, avoiding verbal filler that might be distracting to listeners.
- DESE.SL2.B.9-10 Make consistent eye contact with a range of listeners when speaking, using effective gestures to communicate a clear viewpoint and engage listeners; avoid body language or mannerisms that might be distracting to the audience.
- DESE.SL2.C.9-10 Plan and deliver appropriate presentations concisely and logically based on the task, audience, and purpose making strategic use of multimedia in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- ISTE - CREATIVE COMMUNICATOR.6: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

*Supporting:*

- ISTE - GLOBAL COLLABORATOR.7: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
- TT.AB.I.4: Students will express pride, confidence and healthy self-esteem without denying the value and dignity of other people.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

**Detailed Description/Instructions:** Student teams will create multimedia presentations providing proposal for their LEAD Innovation Studio cultural plans to the LEAD Innovation Studio audience for viewing, feedback, and acceptance.

**Bloom's Levels:** Create

**Webb's DOK:** 4

## Engaging Scenario--For Quarter 2

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)


Provide students with a menu of design challenges to choose from. Students group up based on their interest in provided challenges. Culminating presentations launched at the end of the quarter.






Working in groups, students will apply design thinking to projects of their choice from a menu of options supplied by the LEAD Design Thinking facilitators. These will be on a smaller scale, from pitch to presentation in 8 weeks. Weekly, class will focus time on the mechanics of the framework as it applies to their project, as well as time to work in groups on their projects.

The project menu for this quarter will be created from issues/projects brought from various sources included but not limited to the professional studies programs business partners, LEAD Innovation Studio issues, coursework/content based ideas, personal interests, or suggestions from the community.

Projects will require students to go through the full application of the Design Thinking process and culminate in a formal presentation of a final product.

## Summary of Engaging Learning Experiences for Topics

| Topic             | Engaging Experience Title   | Description  | Suggested Length of Time |
|-------------------|---|--|--------------------------|
| Engaging Scenario | First Days of School  | <p>Day 1 (½ day) - Introduction to design thinking. Students will complete 2 quick design challenge experiences.</p> <p>Day 2 (½ day) - Extended design thinking challenge.</p> <p>Day 3 (½ day) - Designing with the user in mind design challenge.</p> <p>Day 4 (½ day) - Culture Design Launch</p>  | 4-½ days                 |
| Engaging Scenario | Quarter 1 Engaging Scenario   | <p><u>Problem/Question:</u> What should the culture of the LEAD Innovation Studio look like? Why is this culture an important part in making you successful as a person as well as making all of us successful as a team?</p> <p><u>Project Goal:</u> Teams will create multimedia presentations concerning their overall plans and ideas concerning what they believe the culture of the LEAD Innovation Studio should look like. The presentation should be well rehearsed and a length of 5-7 minutes, in a sales-pitch persuasive style.</p> | 1 Quarter                |
| Understand        | Empathy--Look, Listen, and Learn<br> | Students learn to conduct empathy interviews, conduct information gathering surveys, and utilize other methods of investigating multiple perspectives on issues and problems.  | 1 day                    |

|             |  |   |       |
|-------------|--|---|-------|
| Understand  | Define--asking questions, researching, and creating knowledge<br> | Students will conduct research into what defines culture and how it affects a person socially, psychologically, and their growth potential.   | 1 day |
| Explore     | Ideate--Planning and Failing Forward<br>                          | Students will create an outline of all structures and/or processes they believe are necessary in forming their version of the “perfect” LEAD Innovation Studio culture based upon their research and empathy interviews.                                  | 1 day |
| Explore     | Prototype--Try, Create, and Play<br>                              | Students will begin to create representations (i.e., drawings, blueprints, outlines, etc.) of products necessary for cultural “icons/elements” (i.e., flags, shirts, traditions, songs, etc.) to use for representation of their ideations and proposals. | 1 day |
| Materialize | Test--Experiment, Feedback, and Revision<br>                    | Students will take their developed ideations from prototypes and create them into working models, documents, products, etc., and present them to sample shareholders within the LEAD Innovation studio to collect feedback for analysis and revision.     | 1 day |
| Materialize | Implementation--Present, Show, and Reflect<br>                  | Student teams will create multimedia presentations providing proposal for their LEAD Innovation Studio cultural plans to the LEAD Innovation Studio audience for viewing, feedback, and acceptance.   | 1 day |

|                   |                             |   |           |
|-------------------|-----------------------------|---|-----------|
| Engaging Scenario | Quarter 2 Engaging Scenario | Provide students with a menu of design challenges to choose from. Students group up based on their interest in provided challenges. Culminating presentations launched at the end of the quarter. | 1 quarter |
|-------------------|-----------------------------|---|-----------|

## Unit 2: Design Thinking Demonstration

**Subject:** Design Thinking

**Grade:** 9-12

**Name of Unit:** Design Thinking Demonstration

**Length of Unit:** 1 semester

**Overview of Unit:** During this unit, student teams will work through the design thinking process throughout the semester on challenges that are connected with professional mentors, leading to final presentations to mentors and parents the last week of school.

### **Priority Standards for unit:**

- 9-12.ETS1.B.1 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
- DESE.W.1A.9-10 Conduct research to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; gather multiple relevant, credible sources, print and digital; integrate information using a standard citation system. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
- DESE.W2.A.9-10 Follow a writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the task, purpose, and audience; self-select and blend (when appropriate) previously learned narrative, expository, and argumentative writing techniques.
- DESE.SL1.A.9-10 Work with peers to set rules for collegial discussions and decision-making, clear goals, deadlines, and individual roles as needed.
- DESE.SL1.B.9-10 Delineate a speaker's argument and claims, evaluating the speaker's point of view, reasoning, and evidence in order to propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
- DESE.SL1.C.9-10 Respond thoughtfully to diverse perspectives including those presented in diverse media, summarize points of agreement and disagreement, resolve contradictions when possible, and determine what additional information or research is needed.
- DESE.SL2.A.9-10 Speak audibly and to the point, using conventions of language as appropriate to task, purpose, and audience when presenting including appropriate

volume, clear articulation, and accurate pronunciation at an understandable pace, avoiding verbal filler that might be distracting to listeners.

- DESE.SL2.B.9-10 Make consistent eye contact with a range of listeners when speaking, using effective gestures to communicate a clear viewpoint and engage listeners; avoid body language or mannerisms that might be distracting to the audience.
- DESE.SL2.C.9-10 Plan and deliver appropriate presentations concisely and logically based on the task, audience, and purpose making strategic use of multimedia in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- ISTE - INNOVATIVE DESIGNER.4.A - know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- ISTE - INNOVATIVE DESIGNER.4.C - develop, test and refine prototypes as part of a cyclical design process.
- ISTE - CREATIVE COMMUNICATOR.6: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
- TT.AB.D.9: Students will respond to diversity by building empathy, respect, understanding and connection.
- TT.AB.J.11: Students will recognize stereotypes and relate to people as individuals rather than representatives of groups.

#### **Supporting Standards for unit:**

- 9-12.ETS1.A.2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- 9-12.ETS1.B.2 Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
- ISTE - KNOWLEDGE COLLECTOR.3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
- ISTE - INNOVATIVE DESIGNER.4.B - select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- ISTE - INNOVATIVE DESIGNER.4.D - exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
- ISTE - COMPUTATIONAL THINKER.5: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.



- ISTE - GLOBAL COLLABORATOR.7: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
- TT.AB.I.4: Students will express pride, confidence and healthy self-esteem without denying the value and dignity of other people.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- TT.AB.D.8: Students will respectfully express curiosity about the history and lived experiences of others and will exchange ideas and beliefs in an open-minded way.

| <b>Unwrapped Concepts<br/>(Students need to know)</b>   | <b>Unwrapped Skills<br/>(Students need to be able to do)</b> | <b>Bloom's<br/>Taxonomy<br/>Levels</b> | <b>Webb's<br/>DOK</b> |
|---|--|--|-----------------------|
| A solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. | Evaluate   | Synthesize                             | 3                     |
| Research to answer a question or solve a problem  | Conduct  | Apply                                  | 2                     |
| The inquiry when appropriate  | Narrow   | Apply                                  | 2                     |
| The inquiry when appropriate  | Broaden  | Apply                                  | 2                     |
| Multiple relevant, credible sources, print and digital  | Gather   | Apply                                  | 2                     |
| Information using a standard citation system  | Integrate  | Apply                                  | 3                     |
| Relevant information from multiple authoritative print and digital sources  | Gather   | Apply                                  | 2                     |
| Advanced searches effectively   | Use  | Apply                                  | 2                     |
| The usefulness of each source in answering the research question  | Assess   | Evaluate                               | 3                     |

|  |                       |            |   |
|--|-----------------------|------------|---|
| Information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation            | Integrate             | Synthesize | 3 |
| A writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the task     | Follow                | Apply      | 3 |
| A writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the purpose  | Follow                | Apply      | 3 |
| A writing process to produce clear and coherent writing in which the development, organization, style, and voice are appropriate to the audience | Follow                | Apply      | 3 |
| Previously learned narrative writing techniques  | Self-select and blend | Apply      | 3 |
| Previously learned expository writing techniques   | Self-select and blend | Apply      | 3 |
| Previously learned argumentative writing techniques  | Self-select and blend | Apply      | 3 |
| With peers to set rules for collegial discussions and decision making  | Work                  | Apply      | 2 |
| With peers to set rules for clear goals  | Work                  | Apply      | 2 |
| With peers to set rules for deadlines  | Work                  | Apply      | 2 |
| With peers to set rules for individual roles   | Work                  | Apply      | 2 |
| A speaker's argument and claims  | Delineate             | Synthesize | 3 |

|  |                      |            |   |
|--|----------------------|------------|---|
| The speaker's point of view, reasoning, and evidence in order to propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas   | Evaluate             | Evaluate   | 4 |
| Others into the discussion   | Actively incorporate | Apply      | 2 |
| Ideas and conclusions  | Clarify              | Understand | 2 |
| Ideas and conclusions  | Verify               | Understand | 2 |
| Ideas and conclusions  | Challenge            | Understand | 2 |
| Thoughtfully to diverse perspectives including those presented in diverse media  | Respond              | Understand | 2 |
| Points of agreement and disagreement   | Summarize            | Analyze    | 2 |
| Contradictions when possible   | Resolve              | Understand | 2 |
| What additional information or research is needed  | Determine            | Understand | 2 |
| Audibly and to the point, using conventions of language as appropriate to task, purpose, and audience when presenting, including appropriate volume, clear articulation, and accurate pronunciation at an understandable pace, avoiding verbal filler that might be distracting to listeners | Speak                | Apply      | 1 |
| Consistent eye contact with a range of listeners when speaking.  | Make                 | Apply      | 2 |
| Effective gestures to communicate a clear viewpoint and engage listeners.  | Use                  | Apply      | 2 |

|  |             |            |   |
|--|-------------|------------|---|
| Body language or mannerisms that might be distracting to the audience  | Avoid       | Apply      | 2 |
| Appropriate presentations concisely and logically based on the task, audience, and purpose, making strategic use of multimedia in presentation to enhance understanding of findings, reasoning, and evidence and to add interest | Plan        | Apply      | 3 |
| Appropriate presentations concisely and logically based on the task, audience, and purpose, making strategic use of multimedia in presentation to enhance understanding of findings, reasoning, and evidence and to add interest | Deliver     | Apply      | 3 |
| A deliberate design process for generating ideas, testing theories, creating innovate artifacts, or solving authentic problems   | Know        | Understand | 2 |
| A deliberate design process for generating ideas, testing theories, creating innovate artifacts, or solving authentic problems   | Use         | Apply      | 2 |
| Prototypes as a part of a cyclical design process  | Develop     | Apply      | 3 |
| Prototypes as a part of a cyclical design process  | Test        | Apply      | 3 |
| Prototypes as a part of a cyclical design process  | Refine      | Apply      | 3 |
| Clearly  | Communicate | Apply      | 2 |
| Creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals   | Express     | Apply      | 2 |
| To diversity by building empathy, respect, understanding, and connection   | Respond     | Apply      | 2 |

|  |           |            |   |
|--|-----------|------------|---|
| Stereotypes  | Recognize | Understand | 1 |
| To people as individuals rather than representatives of groups | Relate    | Apply      | 2 |

**Essential Questions:**

1. How can a design thinking framework be applied to working on a significant authentic challenge?

**Enduring Understanding/Big Ideas:**

1. Design thinking is an ideology that can be used as a process to approach learning, problem solving, innovation, and creative works in realistic ways.

**Unit Vocabulary:**

| Academic Cross-Curricular Words  | Content/Domain Specific |
|--|-------------------------|
| Design Thinking<br>Empathy<br>Define<br>Ideate<br>Prototype<br>Test<br>Implement<br>Reflection<br>Feedback | Iterate                 |

**Resources for Vocabulary Development:**

“Launch” - John Spencer and AJ Juliani

Design thinking for Educators 2nd Edition (<https://designthinkingforeducators.com/> )

Stanford D. School (<https://dschool.stanford.edu/>)

Nilson and Norman Group (<https://www.nngroup.com/articles/design-thinking/>) article & graphics

Designer’s Workbook - Riverdale IDEO (<https://www.ideo.com/post/design-thinking-for-educators> )

## Engaging Scenario

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

Students choose from a robust menu of challenges that are connected to professional mentors. Student teams will work through the design process throughout the semester, leading to final presentations to mentors and parents the last week of school.

Working as individuals or in groups, students will apply design thinking to large scale projects of their choice from a menu of options supplied by the LEAD Design Thinking facilitators. These will work from pitch to presentation and take entirety of the second semester. Weekly, class will focus time on the mechanics of the framework as it applies to their project, as well as time to work in groups and collaborate on their projects.

The project menu for this quarter will be created from issues/projects brought from various sources included but not limited to the professional studies programs business partners, LEAD Innovation Studio issues, coursework/content based ideas, personal interests, research opportunities, or suggestions from the community.

Projects will require students to go through the full application of the Design Thinking process and culminate in a formal presentation of a final product.

# Unit of Study Terminology

**Appendices:** All Appendices and supporting material can be found in this course's shell course in the District's Learning Management System.

**Assessment Leveling Guide:** A tool to use when writing assessments in order to maintain the appropriate level of rigor that matches the standard.

**Big Ideas/Enduring Understandings:** Foundational understandings teachers want students to be able to discover and state in their own words by the end of the unit of study. These are answers to the essential questions.

**Engaging Experience:** Each topic is broken into a list of engaging experiences for students. These experiences are aligned to priority and supporting standards, thus stating what students should be able to do. An example of an engaging experience is provided in the description, but a teacher has the autonomy to substitute one of their own that aligns to the level of rigor stated in the standards.

**Engaging Scenario:** This is a culminating activity in which students are given a role, situation, challenge, audience, and a product or performance is specified. Each unit contains an example of an engaging scenario, but a teacher has the ability to substitute with the same intent in mind.

**Essential Questions:** Engaging, open-ended questions that teachers can use to engage students in the learning.

**Priority Standards:** What every student should know and be able to do. These were chosen because of their necessity for success in the next course, the state assessment, and life.

**Supporting Standards:** Additional standards that support the learning within the unit.

**Topic:** These are the main teaching points for the unit. Units can have anywhere from one topic to many, depending on the depth of the unit.

**Unit of Study:** Series of learning experiences/related assessments based on designated priority standards and related supporting standards.

**Unit Vocabulary:** Words students will encounter within the unit that are essential to understanding. Academic Cross-Curricular words (also called Tier 2 words) are those that can be found in multiple content areas, not just this one. Content/Domain Specific vocabulary words are those found specifically within the content.



**Symbols:**

This symbol depicts an experience that can be used to assess a student's 21st Century Skills using the rubric provided by the district.



This symbol depicts an experience that integrates professional skills, the development of professional communication, and/or the use of professional mentorships in authentic classroom learning activities.