

Lesson Plan 3

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Lesson Title: Criterion A2 of Unit "Seating task"

Grade Level and Course: 11 (IB DP DT)

Time Segment of Lesson: 35 minutes (it was an assembly day with a shorter schedule)

In this lesson my goal is to demonstrate the IntASC Standards 4,5: Content knowledge, application of content (highlighted = relevant to standards 4-5)

Standard(s) Addressed in Lesson:

All standards are available in [DT Design Technology Guide](#)

The unit plan is available [here](#) The entire unit is PBL (Standard 5) where they need to apply their knowledge (standard 4)

CCSS.ELA-LITERACY.RI.11-12.1

Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

CCSS.ELA-LITERACY.RI.11-12.7

Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

Overarching Unit Goal(s):

Unit: ["Seating task"](#)

Students will

A1 Describe an **appropriate problem** that leads to a design opportunity

A2 Produce a design brief that **identifies relevant parameters of the problem** (in this lesson)

A3 Develop a design specification that **justifies the requirements**, based on the outcomes of the research

B1 Develop **feasible ideas** to meet appropriate specifications that explore solutions to the problem

B2 Use concept modeling and analyzes the outcomes to guide design development

B3 Justify an appropriate idea for detailed development

C1 Justify the choice of appropriate **materials, components and manufacturing techniques** to make the prototype

C2 Develop an accurate design proposal in sufficient detail for a third party to manufacture the prototype

C3 Produce a detailed plan for the manufacture of the prototype.

D1 Justify a testing strategy to measure the success of the prototype

D2 Evaluate the success of the prototype against the design specification

D3 Demonstrate how the prototype could be improved, considering how individual improvements affect the design as a whole.

Objective(s) of the Lesson:

By the end of this lesson students will:

1. Identify parameters for their solutions.
2. Describe the expected outcome of the inquiry.
3. State how the solution will benefit the user.
4. Get familiar with the rubric.
5. At home: Produce a design brief (150 words) that identifies relevant parameters of the problem.

Student Diversity and Differentiation of Instruction

Standards 1-3 are addressed when evaluating students' abilities, approaches, learning styles and designing activities, grouping them considering every students' needs:

Identify students who will need differentiated instruction for this lesson.

Student Diversity	Differentiation of Instruction
<i>All students are ELL</i>	<p>Allowing them to use translation tools on their laptops; allowing more time upon their request (when they work in groups/pairs/independently) on formative tasks; allowing them to ask questions - if something isn't clear.</p> <p>Visual support: images and videos are provided when introducing new concepts.</p> <p>Students are expected to come after classes, if they need additional explanation</p>

<p><i>1 student is on medications. She prefers to work independently and doesn't feel comfortable in social situations</i></p>	<p>In the beginning of each week my mentor gives this student tasks to work on. She is familiar with unit goals and submission requirements.</p> <p>Visual support: images and videos are provided when introducing new concepts. She can always approach and ask additional questions. She is coming twice a week to continue working on her tasks or to ask questions from my mentor.</p>
<p><i>Low performing students</i></p>	<p>Never grouped together; often grouped heterogeneously with medium/high performing students.</p> <p>Visual support: images and videos are provided when introducing new concepts. Students are expected to come after classes, if they need additional explanation or help.</p>
<p><i>Challenging behavior students</i></p>	<p>Never grouped together. Usually grouped with the students, who can role-model expected behavior in a positive environment. Students are expected to come after classes, if they need additional explanation.</p>

Formative and Summative Assessments- include open ended questions that will lead students to think deeply about the content and will also build on prior knowledge.

Formative Assessment	Summative Assessment
<p>1. Design brief</p> <p>Given as a homework assignment part of their written reports.</p>	<p>Students submit their final written report on Moodle. They also submit CAD, the physical low and high-fidelity prototypes.</p> <p>An example of a student's work</p> <p>After the end of unit (not during this lesson)</p>
<p>2. Independent activity</p> <p>Looking at the examples of design briefs of high/medium/low performance and filling out the worksheet</p>	

3. Collaborative activity Each group are design technology teachers who evaluate design briefs according to the rubric - they need to discuss, standardize, and justify their grades	
4. Class discussions, asking questions.	

- If there is no summative assessment in this lesson, what/when will the summative assessment be/take place

Big Ideas to be Addressed in the Lesson:

Gaining familiarity with Internal Assessment (IA) criteria will be highly beneficial to you before you embark on your major project of IA in year 12. In this task we will be using criterion A: “Analysis of a design opportunity” & criterion B: “Conceptual design”. You will be expected to show evidence of achievement against all strands of the criteria.

Our school (the client) wishes to make its foyer area a more attractive environment to parents and to further communicate its brand image. Current seating is not seen as adequate and, arguably, does not promote a strong brand identity or create a welcoming environment. You should provide 1 example of seating Chair/Coach/Sofa (1:5 scale model). Each of you will submit a design separate portfolio to provide evidence for assessment against criterion A (9 marks) and criterion B (9 marks) for this assessment an overall score out of 7 will be given. It's a summative task.

Discussion Questions

1. What is an appropriate problem (according to criterion A1) to explore the design opportunity?
2. What are the elements of design opportunity?
3. What are the examples of parameters/requirements for the solution?

21st Century Knowledge and Skills

21st Century Knowledge and Skills	Teaching Strategies
Critical thinking	asking questions and letting them work on formative assessments using various technology tools (moodle, course websites, external websites)
Collaboration	letting them work in groups, brainstorm, discuss)
Communication	letting them work in groups, brainstorm, discuss
Information literacy	letting them research, read primary/secondary, online/paper resources using various technology tools (moodle, course websites, external websites)

Literacy Skills

Oral language skills (when answering questions, presenting their findings, summarizing reading, when working in groups, brainstorming, discussing, presenting in groups)

Self-regulation and self-monitoring (while reading, speaking, writing, when working in groups, brainstorming, discussing, presenting in groups)

Connecting background knowledge to the information in the text/video (reading, when researching, reading/watching/listening primary/secondary, online resources, searching for examples online)

Reading comprehension (reading with purpose, when researching, reading primary/secondary, online/paper resources)

Writing (working on formative/summative assessments)

Teaching Strategies and Related Student Activities (Include Web 2.0 activities and innovative strategies, as appropriate):

Teaching Strategies and Activities: What are the teaching strategies and activities that you plan to use to help students meet the lesson's objectives? What are the steps that you will take to deliver this lesson (e.g., introduce the author, read the poem, ask students to...)? Make this section as detailed as possible. It should allow you to hand it off to a substitute teacher.

Sections of the lesson	Explain	Mods
(I do, we do) Before the lesson starts: Greet students, let them prepare for the lesson, tell them that they would need their laptops, but need to put away their cell phones; talk about how they are doing, if they want to share anything; or propose a topic to discuss		
Intro (I do, they do)		
(I do, we do) Daily check-in	Short ice-breaking activity. Ask questions	Visual: sentences, images on the slides
(I do, we do) Review of the previous topic (Criterion A1)	Ask what students were preparing for A1; what would be an appropriate problem for this unit, what elements of design opportunity they have identified, etc. For A1, last week, students went to foyer area to explore the problem of current chairs - they took pictures, they prepared two sets of questions for users (school stakeholders: teachers, students, parents, staff)	Visual: questions on the slides

	about what problems they experience and what type of chairs/sofas they would like to have (INTASK Standards 4-5)	
Main part (I do, we do, they do)		
Step by step introduce the expectations for criterion A2 More details are available here This portion is designed to be explained by a teacher so that students could work independently in the consequent lessons in the DT workshop and provide documented process.	Explain what design brief is: A document that designers use to define and guide their design inquiry Describe what parameters are: "what", in a broad sense, will be made and "how" it should perform: Performance, ergonomics, cost, material, environmental considerations, etc. Students should be able to explain how their solution will benefit the users by referring to the research they did in A1 Standards 4-5	keep asking if everything is clear. if yes - ask them to provide examples; if no - provide more examples; if necessary - talk after class (provide more resources to study at home or after class - office hours); Show examples of past or existing works online for internal assessments (IB DP DT IA)
Activity 1 (they do independently)	Provide the examples of design briefs (high, medium, low scores) - they need to identify which one is which, and answer several questions on the task sheet. Provide keys later	Printed (to reduce some screen time)
Explain additional requirement	Provide information about expected use of images and citation style	Visual: sentences, images on the slides (for ESL students); keep asking if everything is

		clear. if yes - ask them to provide examples for each strategy if no - provide more examples; if necessary - talk after class (provide more resources to study at home or after class - office hours)
Activity 2 (they do collaboratively)	Provide sample Criterion A1-A2 examples (from IB website), provide a grading rubric to each team; Ask them to grade according to the grading rubric	Printed material
Review (they do)		
Ask what is needed to receive the highest score in A2	Ask questions. Tell them to complete their design briefs by the end of the week. After Criterion B - students will visit the workshop to start working on their prototypes. The steps that they are doing now are crucial to create a successful product and to learn about the design process.	if necessary - talk after class (provide more resources to study at home or after class - office hours)

Teacher/Student Input: Write a note on what you expect the teacher and students to do as a part of this activity. Include a note on whether this is an “I do it”, “We do it” or “You do it” type of activity.

I do:

- introduce new information,
- provide examples,
- help,
- ask questions

Examples: **Intro:** asking questions, **main part:** introducing the agenda of the lesson, introducing new concepts, providing examples, moderating activities, providing constructive feedback, **review:** asking question, evaluating their responses, answering questions if any

You do:

- provide examples,
- brainstorm with a partner/group,
- research, present,
- ask questions,
- raise hands to provide an input or to ask questions,
- follow classroom norms

We do:

- ask and answer questions,
- help each other,
- do our best to meet the objectives

More information in the table above

Review: Write down ideas on how you will review the topic, including notes on types of formative assessments that you will use during the lesson.

Questions regarding the grading rubric as a lesson overview, the responses will indicate students level of understanding, i.e., questions will cover the knowledge students should demonstrate as a mastery of the standard and based on the covered content:

- What do you need to provide to score highest in the criterion A2?
- What are the examples of parameters you will use in your design brief (examples: quality, performance, human factor, sustainability, cost, material, etc.)
- I evaluate and if I see some students struggling on particular topics - provide as a review of the previous lesson during the next lesson in the beginning.

Materials and Resources for Lesson

Materials, Technology, and Websites	Required Preparation
<i>IB Design and Inquiry website</i>	read, watch videos, get familiar with all the Criteria
<i>Diploma Design Technology website</i>	read, watch videos, get familiar with all the Criteria
<i>Workshop materials: wood, plywood, foam board, fabric Tools: disk/belt sanders, saw, drill, cutter, sewing machine</i>	prepare material and tools, know safety standards; be ready to provide help to students; remind them about Personal protection/safety equipment (goggles, aprons, mask)
<i>External examples</i>	search for ideas, samples outside of regular IB curriculum open source resources

References

Where did you get ideas and resources for this lesson plan?

IB Design and Inquiry website

<https://sites.google.com/view/designandinquiry/ibdp-design/design-project-ia/ia-criterion-a>

[DT Design Technology Guide](#)

Diploma Design Technology website

https://docs.google.com/presentation/d/17qjF2DAe20TogHc0Mp_r73unATq57e-CO1-IqFsxrDM/pub?start=false&loop=false&delayms=3000&slide=id.p37

The unit plan is available [here](#)

[Design technology IB DP Guide](#)

[Design technology teacher support material](#)