

<b>Teacher's Name: Ticey Little</b>				
<b>Domain: Exploring Computer Science</b>				
<b>Date Range: October 21, 2024 – October 25, 2024</b>				
<b>ACOS Standard:</b> 37 - Explore how computers are used as a tool for visualizing data, modeling and design, and art in the context of culturally situated design tools.				
<b>Student Friendly Outcome:</b> I CAN explore how computers are used as a tool for visualizing data, modeling and design, and art in the context of culturally situated design tools.				
Monday	Tuesday	Wednesday	Thursday	Friday
<p>Journal entry (10 minutes)</p> <p>Research on the cultural background (25 minutes)</p> <p>Begin design tool tutorials (20 minutes)</p>	<p>Meeting of Native Peoples Activity (15 min)</p> <p>Video of History (10 min)</p> <p>Acknowledgement of Land (5 min)</p> <p>Research and group posters of symbols (25 min)</p>	<p>Cultural costumes (5 min)</p> <p>Appropriation vs Appreciation discussion and video (45 min)</p> <p>Wrap up (5 min)</p>	<p>Creation of designs using the design tools (55 minutes)</p>	<p>Preparation of presentations (30 minutes)</p> <p>Group presentations (15 minutes)</p> <p>Reflective journal entry (10 min)</p>

**Instructional Lesson # 11. Days 24-28**

**Topic Description:** In this lesson, students learn how computers can be used as a tool for visualizing data, modeling and design, and art in the context of culturally situated design tools. Connections between the design of the tools and mathematics will be explored as well as the connections and importance of culture and technology.

**Objectives**

The student will be able to:

- Explain how computers can be used as tools for visualizing data, modeling and design, and art.
- Explain how cultures and technology are related to one another, and how there are hierarchies among cultures.
- Discuss how technology has facilitated both good and bad ways to represent Native culture.
- Identify mathematical connections in the output of the tools.

**Outline of the Lesson:**

Segment	Reason/Purpose
Day 1 Journal entry (10 minutes) Research on the cultural background (25 minutes) Begin design tool tutorials (20 minutes)	Introduction to how bead looms are both mathematical/technical as well as cultural. Connection to prior lessons about humans and computers' interactions, as well as data. Investigation into the culture of Native American designs and the incorporation of mathematical concepts.
Day 2: Meeting of Native Peoples Activity (15 min) Video of History (10 min) Acknowledgement of Land (5 min) Research and group posters of symbols (25 min)	Explain the history of Native people (and how they are a marginalized population in our society) and for students to understand the deep connections of culture and design within tools, fashion, and other items.
Day 3: Cultural costumes (5 min) Appropriation vs Appreciation discussion and video (45 min) Wrap up (5 min)	Engage in discussions around representation of cultures and how those may lead to either appropriation or appreciation.
Day 4: Creation of designs using the design tools (55 minutes)	Utilizing math concepts to recreate Native American designs on CSDT website
Day 5:	Students share and discuss various

Preparation of presentations (30 minutes) Group presentations (15 minutes) Reflective journal entry (10 min)	cultural influences on design and the connections across all 3.
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### Student Activities:

#### Day 1

- Complete journal entry.
- Research on cultural background
- Each member of the group completes the math tutorial

#### Day 2

- Complete Meeting of Strangers Activity
- Discuss History of Native New York
- Acknowledgement of Land
- Groups research of colors and symbols in Native American designs

#### Day 3

- Complete journal entry.
- Discuss in small groups and define cultural appropriation.
- Watch video and discuss appropriation vs appreciation.
- Participate in reading and discussion
- Participate in wrap up appropriation vs appreciation - student definitions

#### Day 4

- Create designs using the design tools

#### Day 5

- Prepare presentations.
- Groups deliver presentations.
- Groups respond to questions from other students and teacher.
- Complete reflective journal entry

### Teaching/Learning Strategies:

*Note: This series of lessons begins with connections to data taught in previous lessons as well as input/output from the computing lesson, then gets into teaching about the history and cultures of Native people and how they were/are marginalized. It may be helpful to explain this to students at the beginning of these lessons so students understand the connections and importance of each day.*

#### Day 1:

- Journal Entry: *How might these give off data?*
  - (showing pictures of bead loom, rug, and basket from CSDT website specifically that they will use in this lesson; to see the pictures, click on “Mathematics” at the top, then scroll down to where you see “Cartesian Coordinates”)
  - Remind students of the prior lessons about data and how it was defined or explained during those lessons

- Have students share what about these designs might be considered data (is it the colors, the patterns/math, the materials, the size, or more deeply the culture embedded into these designs?)
  - Explain to students that some of these designs will be created in this series of lessons in groups and that we will be learning more about native cultures over the next few days
- Research on cultural background
  - Post the possible design tools:
    - Bead Loom
    - Pacific Northwest Basket Weaver
    - Navajo Rug Weaver
  - Display the first page of each tool in a screenshot or image of the designs for visual reference.
  - Display the first page of each tool in order to give students an idea of what each does. You can access these by going to CSDT.org then clicking on Mathematics then scrolling down to Cartesian Coordinates (the three choices are listed there).
  - Students divide into groups to work on the tool of their choice.
  - Group sizes will depend on the size of the class. You may need to have more than one group per tool.
  - Each member of the group should go through the entire cultural background section individually.
    - As students are reviewing the background section ONLY to learn more, they should be taking notes (at least 5 important ideas they read) on the culture and how that connects to both math and/or design. They should also be noting any questions they have.
  - All group members discuss the background.
  - Resolve answers to questions and mathematical connections.
- Design tool tutorials
  - Each member of the group completes the tutorial (Note: These are only available for Bead Loom and Navajo Rug Weaver but NOT for Pacific Northwest Basket Weaver. You may choose to differentiate your groups based on this, or work with that group more closely to explain how it works. Also please note that ALL designs should be done with the MATH software, NOT the programming software as this will be taught more directly in later units).
  - Students should go through the tutorial at their own pace, but discuss with other members as questions arise.
  - Encourage students to record in their journal points that they want to remember.
  - At this point, as students work, they may (depending on their prior math coursework and strengths/weaknesses) need your assistance in explaining concepts like symmetry

## Day 2

- Meeting of Strangers Activity
- Create cards or some way for students to find random partners in the class to allow for more community-building opportunities and diverse groupings. Give each student a card and have them find their partner without talking. This could be matching colors, letters, numbers, emojis, etc. (example: students with the “red triangle” on their card will find each other - students should be in pairs after this activity)
- After the students find their partners, WITHOUT TALKING (or writing), ask them to try to find out the following about the other person for 1 minute then switch roles (Note: you can add to or modify these questions based on the needs of your students and their personal interests or comfort in sharing):
  - What did you eat for breakfast today?
  - How did you get to school today?
  - What are your plans for this weekend?

- Debrief activity with students (note that this is front loading the experience of Native Americans and Europeans in early American history - but do not necessarily name this for students yet - they will see a video after this discussion):
  - What made the interaction difficult? Since you couldn't speak, how did you communicate with your partner? What helped you understand your partner?
  - How might this lead to confusion if you were trying to settle an argument or come up with a resolution to a problem?
  - Was there any particular person with more or less power in this exchange? Who? Why? (this can lead to further discussion later when we address the themes around oppressed Native Americans by the white European settlers)
- History of Native New York
- Watch video here the History of Native New York video (See resources.)
  - The video addresses how the fur trade brought together Native people and Europeans, two dissimilar cultures that looked and spoke very differently from one another. Additionally, this brings up the power that European settlers felt they had over Native populations and ideas around which cultures (language, designs, money, etc.) are more valuable.
  - *Note: If there's a more locally relevant historical reference about Native people, you may want to use that here.*
- Discuss in small groups:
  - How did language impact the relationship between Native Americans and the Europeans? What happened as a result of their lack of similar languages? What potential was there for stereotyping and developing singular, simplistic stories of Native Americans?
  - Who told this story in history? How might that impact it?
  - Does this kind of miscommunication still happen today when dealing with people from different cultures? Give some examples. Are some examples more harmful than others? Which cultures tend to believe theirs is more valuable? Which do not? It might be helpful to show students the graphic around power and privilege at this point in the lesson (See resources.) to explain how this still exists today as well - or to support students in coming up with examples.
  - NOTE: Emphasize to students the point made in the video that Native accounts and perspectives are often left out of history. Native histories were maintained through oral traditions and mnemonic devices, such as wampum belts, and are reflected in the material culture. The fact that Native people did not have a written language has had tremendous implications for how history has been recorded, passed down, and understood. Much of what historians know regarding life in and around the Hudson River Valley during the fur trade has come from Dutch documents, archaeological material culture, and Native oral traditions. When reviewing the featured sources in this inquiry, students should be encouraged to ask themselves:
    - *Who wrote the source?*
    - *Which voices are present and which are not? When was the source written?*
    - *What else was happening at that time?*
    - *Who was this written for, and why was it written?*
- Land Acknowledgement:
  - To deepen student conversations, teacher can show the map of Indigenous land they are living on today using this site: <https://native-land.ca/>
  - This article gives more information on the map for the teacher: <https://www.npr.org/2022/10/10/1127837659/native-land-map-ancestral-tribal-lands-worldwide>
- Research colors and symbols in Native American designs
- Student groups research different colors, symbols, and images in Native American designs to create a group poster about their findings. Note: There are many different symbols so you could have students focus on only a

few for this work or ask them to choose ones that connect to their own identity (you can reference their identity charts from the beginning of the unit also). (10 minutes)

- If there are symbols or designs that are specific to your geographical region and populations of Native individuals, this would be a great time to highlight those.
- These are resources you could give students if they aren't researching on their own:
  - <http://lewisandclarktrail.com/section2/colorsanddesigns.htm>
  - <https://www.faustgallery.com/symbolism-behind-color-in-native-american-art/>
- Have students read this article about misunderstanding symbols as well: <https://www.sltrib.com/news/2017/08/29/uproar-at-salt-lake-city-market-raises-decades-old-question-will-the-ancient-native-american-swastika-always-be-a-symbol-of-nazi-hate/> and discuss if any of the symbols they chose to focus their poster on could have any misinterpretation as well
- Have students do a gallery walk and ask them to write the following on sticky notes.
  - What do you notice about the symbols and colors described on each poster?
  - What similarities exist across these symbols and colors?
  - Why do you feel these were important symbols in Native culture?

### Day 3

- Journal Entry: *How Would You Make A Historically Accurate Iroquois outfit?*
  - Debrief Halloween costumes similar to this and others that may fall into this category.
  - Note: It should be apparent by the end of this discussion that most “cultural” costumes that are produced for purposes like Halloween are not actually historically accurate and cannot be appropriate when the person wearing it doesn't associate with this identity - ie. someone wearing blackface that identifies as white (more background information can be gained here for teachers: <https://www.youtube.com/watch?v=zSV7Hi2eYLQ> although this video is too long to show students)
- Debrief
  - Discuss in small groups:
    - How would you describe cultural appropriation?
    - What are some examples you've seen before?
  - Share out and define cultural appropriation for students as the unacknowledged or inappropriate adoption of the customs, practices, ideas, etc. of one people or society by members of another and typically more dominant people or society.
- Show video and discuss
  - Cultural appropriation video (See resources)
  - Ask students what's the difference between cultural exchange, appropriation and appreciation, having them define each term in their own words and giving one example of each.
- Reading and discussion
  - Have students read the article on Indigenous People's Day (See resources.)
  - Discuss the following questions in groups:
    - Why have some places in the United States renamed this holiday? Why have some not?
    - What is the impact of the naming as Indigenous Peoples day as opposed to Columbus day?
    - What does our school community call this day? How about other schools around the country? Why might that be the case?
    - What responsibilities do schools have to teach us about the history and culture of Native Americans?
    - What other holidays have been more newly announced as national holidays in the U.S. and why do you think this has happened? Why is Indigenous Peoples day not a national holiday?
- Wrap up

- Have students share out a summary of appropriation vs appreciation with examples of each. Note: This could be used for the final presentation in this series of lessons.

#### Day 4

- Creation of designs using the design tools
  - Groups create designs using the Grade 4–12 Math software.
  - Each person should choose one of the goal pictures (by clicking the picture on the right to choose) for practice and discuss any issues with the other group members.
  - Groups decide whether they want to create one design as a group or have multiple designs for their presentation.
  - Groups work on design/designs—these should be their own creations rather than a mimic of one of the preloaded designs.

#### Day 5

- Preparation of presentations
  - Prepare presentations to include:
    - Culture—an explanation in their own words
    - Math connections—an explanation in their own words
    - Demo of software
    - Display of designs—include a written description of how they created their design and the meaning behind it (this could be related to the colors they chose or the design created)
- Group presentations
  - Groups deliver presentations.
  - Groups respond to questions from other students and the teacher.
  - Specifically ask, what did the computer scientists who created the tools need to know? (Computer science, graphics, culture, anthropology, visual arts, language arts, history, etc.)
  - Ask students to wrap up (if there's time) by answering one of the following journal prompts:
    - How did your understanding of the culture influence your creation?
    - Why was an understanding of the culture important to the original design principles behind this tool?
    - When doing the cultural research what did you find the most interesting? What inspired you the most?
    - What was your process in designing your artifact? How does this process compare with the process outlined on the website?
    - What is the connection between computational practices and culture?
- Reflective Journal Entry: *How does technology help us visualize data, culture, and mathematics? What are the benefits and limitations of this?*

## Resources

- <https://csdt.org/math/>
  - Bead Loom: <https://csdt.org/culture/beadloom/index.html>
  - Basket Weaving: <https://csdt.org/culture/northwestbasketweaver/index.html>
  - Rug: <https://csdt.org/culture/navajorugweaver/index.html>
- Meeting of strangers activity adapted from:  
<https://americanindian.si.edu/nk360/manhattan/pdf/manhattan-staging-question-teacher-instructions.pdf>
- <https://americanindian.si.edu/nk360/manhattan#staging> (History of Native New York)
- [https://www.thisishowyoucan.com/post/\\_wheel\\_of\\_power\\_and\\_privilege](https://www.thisishowyoucan.com/post/_wheel_of_power_and_privilege) (Wheel of Power and Privilege)
- <https://www.youtube.com/watch?v=KXeJdHrgOul> (Cultural Appropriation video)
- <https://www.nytimes.com/article/indigenous-peoples-day.html> (Indigenous People's Day article)

## Teacher Reflection Notes