



## Distance Learning Math Lesson Planning Guide

Start with the essential question of the Unit, and build lessons in the 5-E format (Engage, Explore, Explain, Elaborate, Evaluate).

Strategies can be used repeatedly or rotated. Some strategies can be used in many ways.

	<b>IN-PERSON/HYBRID</b> (face to face learning in a hybrid model)	<b>SYNCHRONOUS</b> (live, virtual setting) (NSQOT linked)	<b>ASYNCHRONOUS</b>
<b>ENGAGE</b>	Post a question for students to think about, and have them signal when they have a response. They can stop signaling after they've shared their thinking with the class.	<a href="#">Display an image for the class that is connected to the lesson's learning target. Have students share their thoughts using Jamboard or just the chat box. To help guide discussion, post a prompt or question to elicit specific responses. (continued in the Explore phase) [B1]</a>	Use a KWL chart. Introduce one main part of the topic, such as a single word, via email or class website/Google Classroom. In the first two columns, have students list what they "Know" and what they "Want to Know" about the topic. The Learn column can be revisited in the Explanation and/or Evaluation phase of the lesson, or even later in the unit. (additional columns can be added to suit your needs)
<i>The goal is to hook the students' interest and to begin having students engage with the foundational knowledge and skills necessary for understanding of the new concept, as well as the Standards for Mathematical Practice.</i>	Play a short game that is easily accessible for all students, builds on previous knowledge and skills, and uses just a few materials.	<a href="#">Display a set from "Which One Doesn't Belong?". Have students respond on Jamboard or a Google doc with the image displayed. If on Zoom, you can also use the Annotate feature here. [D1]</a>	Post a task that is accessible to all students without much adult help, something they can definitely do on their own but engages them in applying previous knowledge and skills. This can then be used as the introduction to a lesson in the Explore phase.



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	<p>Use curiosity to create an environment for critical thinking. Place the materials needed for the lesson in a box (or bag), and as you remove them from the box, have students suggest what the materials might be used for, how it might connect to things discussed previously.</p>	<p><a href="#">Play a video that introduces the concept or builds on prior knowledge. In this phase, students should begin to think about the lesson concept. Have them take notes while watching the video, or create a diagram or graphic to indicate what they got from the video. (continued in Explore phase) [F4]</a></p>	<p>Post a series of numbers or mathematical statements, and ask students to think about it. Have them jot down their ideas about patterns they notice and what they wonder about the set of numbers or equations.</p>
	<p>Guess the Topic - post a list of words related to the lesson topic, and have students offer guesses for what they will learn during the lesson. The words could be vocabulary terms or words related to real-world application of the concept.</p>	<p><a href="#">Post a poll or survey related to a previously assigned asynchronous task using an online app. Have students respond to the poll. Discuss the results as a class in the Explore phase. [B3]</a></p>	<p>Assign a concept map. Give students a topic to start the concept map, and have them fill in what they know or are familiar with about the topic. This can be revisited in the Explain phase or later in the unit to have students update their concept map.</p>
	<p>Post instructions on the Smart Board (or whiteboard) that require students to collect any tools needed for the day. When they get to their desk, have them jot down what they know about each tool.</p>	<p><a href="#">Post a real-world problem for students to ponder and jot down their thoughts - possibly in a Notice and Wonder chart within a notes platform, learning management system, or a Google doc. [F4]</a></p>	<p>Have students discuss a mathematics topic with their parents, asking their parents to talk about how it might be used in their daily lives.</p>

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	<p>Post a writing prompt for students to think about and respond to in a journal. Students can use creativity in designing their journal entry, including graphics, graffiti, words/writing, diagrams, or flowcharts, etc. Allow an opportunity for sharing in the Explore phase of the lesson.</p>	<p><a href="#"><u>Post work from a foundational concept but relevant to the lesson that includes at least one mistake, and have students share their thinking about it. If you feel comfortable, share work submitted by one of your students with no identifying features. [B1]</u></a></p>	<p>Send students some short puzzles to work through that are related to the lesson topic. This could include shape puzzles or diagrams with missing pieces. Have students consider what common theme runs through the puzzles.</p>
<p><b>EXPLORE</b></p>	<p>In small groups, have students share their thinking around the engage task or activity. Have them come to consensus on a group idea that builds on previous knowledge. (this can follow any of the strategies listed in the Engage phase)</p>	<p><a href="#"><u>(continuation from Engage phase - Jamboard) Using the responses on Jamboard about the image, have small groups discuss trends in student thinking and understanding and develop a prediction for how the image will be connected to the learning for the day. [B3]</u></a></p>	<p>(continuation from Engage phase - accessible task) Using sample student work or work from other students in the class, have students comment on a comparison between the work they see and their own work.</p>
<p><i>As indicated in the name of this phase, here is where students explore both their understanding of knowledge and skills connected to the new concept but also how those connections support understanding of new learning. The teacher is the facilitator of the learning, allowing students a chance to develop curiosity and an understanding through exploration.</i></p>	<p>Using appropriate tools, allow time for students to individually and collaboratively investigate a problem or phenomenon. Groups should describe what they think is happening in their own words, terms they are familiar with.</p>	<p><a href="#"><u>(continuation from Engage phase - video notes) In small groups/breakout rooms, have students compare their notes from the video introduction. Each group should select a Recorder, whomever has the next closest birthday, to document the discussion highlights, and a Spokesperson, the student with the most siblings, should report out on the group's ideas. [B1]</u></a></p>	<p>(continuation from Engage phase - series of numbers/equations) Give students a few more examples of the same type of series (numbers or equations) and have them reflect on their ideas from the Engage task. Ask them what they notice about all of the series taken as a group.</p>

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	<p>Give students a hands-on task that involves data collection and a recording table. In small groups, have students analyze the data collected and come to a conclusion, or answer a given question that support conceptual understanding.</p>	<p><a href="#"><u>Provide a building task for students to think about individually first, and then have them collaborate in groups in breakout rooms to create a diagram or picture of their solution/response to share with the group. Encourage the use of an online collaboration program, such as Padlet, or even the use of a shared Google doc or slide. [F7]</u></a></p>	<p>Send students to an online simulation that involves changing variables, and have them record their observations. Then have students create an explanation of the concept presented, using words, a graphic, or a diagram. This could be shared with other students through the class website. (continued in Explain phase)</p>
	<p>Give student groups a couple of similar problems to solve or questions to answer that support understanding of the lesson concept. Each group should create something to share with the class that explains their solution as well as the thinking behind it.</p>	<p><a href="#"><u>Provide a set of various responses to a question (or solutions to a problem). Have student first choose the response they like the best and then discuss their thinking in small groups, coming to a consensus on which response or solution the group finds to be the most efficient or accurate and precise. [B3]</u></a></p>	<p>Give students clips from various articles found online (or links), and have them explore what each says about the given topic. Ask students to summarize the information shared across the articles, as well as any contradicting information.</p>
	<p>Create observation stations around the room, and have students move from station to station making observations. The goal is for students to come to a conclusion about the objects/images related to a particular concept.</p>	<p><a href="#"><u>Present small groups with a related set of short tasks (not multi-step problems, separate tasks on the same skill). Students should complete each task individually first, and then they can compare their answers or responses with their small group, either in a breakout room or through the use of a discussion board app. (continued in Explain phase) [B1]</u></a></p>	<p>Post a list of seemingly random objects that are all related to the lesson topic. If available, have students collect them from around their house or find pictures of each thing online to paste into a Google doc (in order to see all objects together). Ask them to reflect on what the objects might have in common.</p>



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<p><b>EXPLAIN</b></p>	<p>(continued from Explore phase - problems solved) From the tasks completed in exploration, select a variety to share, some accurate and some showing misconceptions. As a class, analyze the work (no identifying marks). Guide the discussion to help students come to an accurate conclusion about the lesson's concept.</p>	<p><a href="#"><u>(continuation from Explore phase - short tasks) As small groups are comparing responses, have them also compare the questions asked, related to the answers given. Ask students to analyze the tasks for trends and prepare a poster on a collaborative platform about the concept presented in the related tasks. Monitor discussions to ensure accuracy as students are performing their analysis. [D2]</u></a></p>	<p>(continuation from Engage phase) Ask students to return to the KWL chart. Based on what they have discovered so far, have them complete the L (Learned) column. If there will be a continuation of this lesson, students could also add a column for unanswered questions or things they were left wondering.</p>
<p><i>While the teacher can play a more central role here, students should have an opportunity to explain their own thinking. The teacher is still the facilitator of the learning but also needs to help clear up any misconceptions and ensure that accurate information is being shared.</i></p>	<p>Provide a source for students to read and discuss in small groups. Have them compare what they learn from the informational text to what they learned from the Explore activities. Small groups can share with the class.</p>	<p><a href="#"><u>Present information vital to conceptual understanding in a question-answer format. Post a question for the class to answer together, and guide discussion to highlight important takeaways. [B3]</u></a></p>	<p>(continued from Explore phase) Provide examples of situations that highlight what students observed in the Explore task using the online simulation. Have them consider what they concluded previously, compared to other students, and compared to the subsequent examples provided.</p>



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	<p>Have student groups research real world applications or phenomena that help explain the lesson concept. Groups should develop a model of the application to share with the class, such as in a brief oral presentation, to explain what they learned from their research.</p>	<p><a href="#">Send students to an outside resource, such as Khan Academy, to watch an explanation video and attempt a few practice exercises. Have them take notes during the video and show their thinking during the exercises. Tell them to be prepared to share out to the group or class. [B2]</a></p>	<p>(continued from Explore phase - concept map) Given what they have learned so far, and based on additional explanation from the teacher or other resource, ask students to revisit their concept map and update it using what they now know.</p>
	<p>Give students an article to read and respond to. The article should provide some specific information on real-life aspects of the math concept. This can be the springboard for class or group discussions, in which students combine their prior knowledge with the information in the article to explore more about the topic.</p>	<p><a href="#">Use an online program, such as FlipGrid, to have students explain the lesson concept using their own thinking. This could be done individually or in small groups or pairs. Students will be teaching each other. [B1]</a></p>	<p>Send students on a webquest. Provide a selection of previewed web pages for students to find specific information connected to the concept. Students synthesize the information, which provides them with key concepts and vocabulary for the topic. Students would take notes or otherwise show work done in the synthesis of the information to present to the class.</p>
	<p>Model efficient note-taking from class discussions to help students organize their thinking, while also guiding students to conceptual understanding. Emphasize use of notes and how they can support deeper understanding and future learning. (can use interactive notebooks, online notes, journals, picture journals, etc.)</p>	<p><a href="#">Use the chat feature in the meeting platform to generate discussion. Post questions on the screen or in the chat box, and have students respond in the chat box when given the signal to press "Enter". [C3]</a></p>	<p>Use an online video app, such as EdPuzzle, to assign videos with questions embedded within. This is a great formative assessment tool to determine student understanding so far in the lesson.</p>



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<p><b>ELABORATE</b></p>	<p>Post work from the tasks used previously in the lesson around the room, and have students do a Gallery Walk, looking specifically for similarities that support targeted learning. To steer thinking in a direction, provide students with a clipboard and a couple of specific questions to answer about each posted piece of work.</p>	<p><a href="#"><u>From high quality instructional materials, post a set of practice exercises on the class website, or use an online program, for students to work through, individually or in small groups. Provide feedback in real time as students are working through problems to support accurate conclusions. Review trends in feedback as a class to wrap up the lesson. [F4]</u></a></p>	<p>Have students revisit what they have accomplished so far and reflect in a journal to connect the tasks and ideas presented. Ask students to use creativity in mapping out the tasks and ideas for the lesson or unit.</p>
<p><i>This is an opportunity to deepen understanding of the knowledge and skills reflected in the lesson. Teachers are encouraging students to apply skills and concepts in new situations, allowing students to draw reasonable conclusions from the evidence in the tasks and activities attempted in the first three phases.</i></p>	<p>Use an interactive online practice program with real time data and computer-generated feedback. Have students practice individually while pulling small groups (or even 1-2 students) into another area of the room for support. As students are working individually, have them jot down mistakes they learn from to share in class discussion, if comfortable. Use observations from working with small groups/pairs and what students jotted down while working to guide the lesson wrap-up.</p>	<p><a href="#"><u>Give students another chance to apply the knowledge and skills developed in the first three phases with small changes to the previously attempted tasks, such as with different numbers or a different context. Have student groups in breakout rooms or online discussion platform consider and explain how the 'new' task supports learning from other tasks completed during the lesson to solidify deeper understanding. [D2]</u></a></p>	<p>Find an easily accessible online game or animated, interactive task that includes supports for deeper understanding, while driving home the knowledge and skills addressed in the lesson. Have students reflect on how this connects to what they did previously in the lesson.</p>

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	<p>For groups that are struggling at this point: teachers can further support understanding by going back over previously completed tasks to help students reach understanding. As a class, work back through each task, or in small groups, to guide students in seeing the connections. As students work back through the tasks, ask them what they saw this time that they didn't previously, or what changes occurred in their thinking.</p>	<p><a href="#">Use the discussion feature in Canvas (or other learning management system) to post questions for students to discuss. Include higher-order thinking questions that support the learning target while also engaging students in Standard for Mathematical Practice #3. Include structure around the discussion to keep responses succinct and accurately supporting conceptual understanding. [D5]</a></p>	<p>Use an online learning tool, such as Quizlet, to have students practice the knowledge and skills gained so far in the lesson. Quizlet includes flashcards for vocabulary support, study guides, and practice sets. Students can interact with the learning tool in a variety of ways that the teacher can monitor from their account.</p>
	<p>For groups that are already proficient with the lesson topic, this phase can be used as an extension to the lesson concept. Students could further research the lesson topic, or dive into the next level of connected knowledge and skills.</p>	<p><a href="#">To support struggling students in this setting, schedule a time after the rest of the class leaves the meeting to go over gaps in understanding with pairs or small groups. Use the tasks from the lesson or similar tasks to review the conceptual understanding. To support students already proficient with the concept, allow them to explore challenging tasks related to the lesson topic in place of the Elaborate tasks used with the rest of the class. [D3, F6]</a></p>	<p>While it is not ideal to go through this phase asynchronously, or students working only independently, this can be an opportunity to individualize each student's experience. Using their notes and tasks completed so far, have students create their own explanation of what they have learned in whatever format or media they choose. Ask them to provide either an outline or rough draft to you for feedback, and then the polished product can also be used as a form of assessment for the Evaluation phase.</p>





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<p><b>EVALUATE</b></p>	<p>Round Robin - In small groups, give students an application exercise that includes multiple parts. Each student in the group will do one part of the task, and the group will review it together before submitting it to the teacher for feedback.</p>	<p><a href="#">Use a Google form to give students a short set of practice exercises that include opportunities to explain their thinking. Use the screen to display results in real time as students work through the exercises. Use the data to guide discussion around the exercises and to help catch misconceptions that are present in a majority of the class. [G5]</a></p>	<p>Assign a set of practice exercises for students to complete individually, either online or with paper and pencil. Students should submit their work, with justification for reasoning, to the teacher via Google Classroom or class website for feedback.</p>
<p><i>Teachers need to assess student knowledge and skills, while also giving students an opportunity to self-evaluate their learning throughout the lesson or unit. It should be emphasized that a variety of formative assessment strategies should be used to gain an insight into student understanding and to provide feedback to them. Additionally, students should be made aware of their learning progress throughout the unit.</i></p>	<p>Give students an exit ticket with a target task to attempt with a partner. Pairs should show both students thinking and should submit before leaving the classroom.</p>	<p><a href="#">Use the online component of the adopted high quality instructional materials to assign practice problems. Elicit reasoning behind work submitted as students are working through problems. Meet with small groups that seem to be on the same reasoning track or are drawing the same misconceptions, to give feedback on their work. [G7]</a></p>	<p>Have students create an online 'portfolio' of the tasks completed during the lesson, and reflect on the learning achieved. This can also be done for the unit, having students add to it after each lesson.</p>

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	<p>Assign a short project or activity that requires students to refer back to their notes. As they work through the assignment, have them reflect in their notes how they are using what they learned to complete the task.</p>	<p><u><a href="#">Have student groups use Google slides or another presentation app to develop a lesson summary for the class. They should highlight the learning that was built through each phase of the lesson. Teachers should pop into breakout rooms to observe group work and ensure accurate conceptual information is being shared. Students could use stories, tasks/problems, verbal explanations, diagrams, and/or graphics to explain. [G1]</a></u></p>	<p>Post the beginning of a math problem, such as some background information, and have students finish writing it.</p>
			<p>Have students work with their parents to design a 3-D model of the lesson concept made with things found around the house.</p>