Lesson Plan – 9 Times Table

Introduction

The 9 times table is taught by Paris the Panda. Paris is friendly Panda who likes a bit of sparkle in her life.

The 9 times table is one of tables that students struggle the most with. When designing the App, the nine times tables required some thought. To truly teach it using number sense would require the use of subtraction, with 9 times being 10 times minus 1 times. This would require the students to also know subtraction as well as basic addition to complete all 156 questions. There also a number of patterns that can used to solve the 9 times table up to 10 times 9. After much thought, the decision was made to teach the 9 times table using the simplest method for the student which is to use their hands for up to 10 times 9 and number sense for 11 and 12 times, whilst including all the 9 times patterns and the use of number sense to solve by subtraction in the correct answer and congratulations videos. This lesson plan incorporates all of these concepts to give each student a comprehensive understanding of the 9 times table, whilst also ensuring that they will never stress about remembering them as they "carry their hands with them everywhere, even into exams".

Paris helps explain to the students in her own unique way that "the best way to solve nine times is to use your hands. If you hold hands up with your palms facing you and drop the finger of the number being multiplied by 9, then the 10's in the answer are on the left hand side and the 1's in the answer are on the right hand side of that dropped finger. A very simple concept that is easily practiced and recalled by the student whenever they see a 9 times problem. Paris goes onto explain that this only works up to 10 times 9. She then explains that 11 and 12 times 9 can be solved using number sense. These can be solved by adding 1 times and 2 times to 10 times. When the students' progress to the 11 times and 12 times table, these are taught using the same methodology.

Within the correct answer scenes, the patterns that exist in the 9 times table (up to 10 times) are explained and should be explored with your students. They are:

- If you add both numbers in the 9 times answer together, then they equal nine. By teaching with the hands you can easily show this

pattern. For all answers there is one finger dropped and hence only 9 fingers remaining.

- In each of the answers, the 10 digits are increasing by 1 as the ones digits are decreasing by 1. This is shown using scales in the App but can also be demonstrated using the technique taught on the hands. If you start by dropping the first finger, then second, then third etc. the students should be able to easily recognize that the tens are increasing by one in the answers at the same time as the ones are decreasing by 1.
- The tens digit in the answer is always one less than the number being multiplied by 9. This makes sense when you use your hands because the tens number always finishes one finger before the one you drop which is the number being multiplied by 9.

In the correct answer video, Paris introduces the student to how to best solve the 9 times using number sense by just subtracting 1 times from 10 times. If your students are competent in subtraction, then it is well worth spending the time to explore this strategy.

Learning Outcomes

- Each student understands that the answers to the 9 times tables (up to 10 times) can be worked out using their hands and are competent in doing so.
- Each student can use number sense to solve 11 times 9 by just adding 10 times 9 and 1 times 9 together.
- Each student can use number sense to solve 12 times 9 by just adding 10 times 9 and 2 times 9 together.
- Each student understands that there are a number of patterns that exist in the up till 10 times 9 and can show how these patterns exist using their hands. These patterns include the 2 numbers in the product adding up to 9, the 10's digit in the product increasing by 1 and the one's digit decreasing by 1 and the ten's digit in the answer always being one less than the number being multiplied by 9.
- Each student understands that if you swap the 9 around in the multiplication you get the same product, or answer (commutative property).

- Each student continues to develop their mindset through the feedback provided for correct and incorrect answers.

Resources Required

- The App on a device with 3GB of available memory to download all of the videos
- Overhead projector or TV Monitor connected to the device (if teaching in a Group)
- Paper and pens/pencils for students
- Cardboard
- Coloured pencils or crayons

Scenes

- This activity involves watching the "Learn" scene, followed by the "Tips" scene and then successfully answering all twelve 9 Times Table questions. After login, select the "Learn the Times Tables" button followed by the "Start" button or "9 Times" tile on the Home Screen. Before commencing the lesson make sure that you have completed this step as the it will start the process of downloading the 9 times videos which will take a few minutes.

Lesson

Time	Task
29 mins	**<u>Key Concepts for 9 Times</u>** Select the "9 Times" tile on the home screen. Select the "Learn" button and watch the video (5 minutes). At the conclusion of the video, ask the student/s: **"What were Paris the Panda's key messages within the Learn video?"** Responses should include but not be limited to: - The answer to the 9 times tables are in your hands (up to 10 times 9) - To work out the answer you hold your hands up with your palms facing you and drop the finger associated with the number being multiplied by 9

	- The tens are on the left-hand side of that finger and the ones are on the right. - You add the ten's and the one's and put these together to get the answer. - You run out of fingers at 10 times, so you need to use number sense to work out 11 times and 12 times - 11 times can be solved by adding 10 times and 1 times to get the answer of 99 - 12 times can be solved by adding 10 times and 2 times to get the answer of 108.
20 mins	**<u>Tips to help with 9 Times</u>** Select the "Tips" Button and watch the "Tips" video on the Practice screen (1.5 minutes). You can expand the video to full screen by pushing the expand button on the top right-hand corner of where the video is playing. It will automatically drop back to the practice screen at the end. At the conclusion of the video the first question will play. Wait for it to finish and ask the student/s: **"What were Paris the Panda's key messages within the "Tips" video?"** Responses should include but not be limited to: - You don't need to use your hands for 1 times and 10 times as you can swap the numbers around and solve using 1 times and 10 times to get the answers of 9 and 90 (commutative property. Ask if there are any other times tables they have learned where it also makes sense to swap the numbers around) - The finger you drop is the number of groups in the question. In this example it was 7 packs or seven groups of 9 strawberries, so you drop your 7th finger. - The tens are on the left-hand side of that fingers and the ones are on the right. - You add the ten's and the one's and put them together to get the answer, in this example of 63.

	- You will need to use number sense to solve the 11 times and 12 times questions, using 10 times plus 1 or 2 times.
60 mins	**Solving the 9 Times Tables** The objective is to work through the 12 nine times questions until all 12 stickers are obtained for the correct answers. You also want to enter some mistakes, firstly so the students can all learn from the mistakes and, secondly so you can listen to Paris and her "Growth Mindset" advice when you do make a mistake. This activity can be done as individuals, in groups of up to 4 students or as a class. "OK. It's now time to warm up those hands. For each real-life example, you will need to look at the question and firstly work out the times tables problem that you need to solve and write this in the working out space. The numbers are in bold to make it easier. Remember the way to write it is the number of groups multiplied by the objects. I then need you to solve that problem. We will then type it in and check if it is the correct answer." Help the students with the first question which will be x times 9. Show the working in the working out space by writing the equation and then highlighting there is x groups each with 9 objects resulting in the equation x times 9. Then ask, - "If there are x groups of 9 objects (or 9 groups), then let's drop the finger for that number to work out the answer or use number sense if it is an 11 or 12 times question. - Work out the answer by counting fingers or completing the number sense calculation - Type the answer and select the "Check" button - Watch the correct answer video from Paris • **NOTE:** Within the correct answer videos, Paris will explain a number of 9 times patterns which include the 2 numbers in the product adding up to 9, the 10's digit in the product increasing by 1 and the one's digit

	decreasing by 1 and the ten's digit in the answer always being one less than the number being multiplied by 9. As they appear you should explore each of these with the students. All of these patterns can be demonstrated on the hands by dropping each consecutive finger to show the pattern. It would further reinforce the learning if as the patterns are demonstrated on the fingers, they are written on the board. - Select the "I've Got This" button to receive your sticker - Select the "Next" button and the next question will automatically appear on the practice screen - Ask each student or groups to solve this one using their hands or number sense. Give them a few minutes to report back. - Ask first if there are any ways you could make a mistake with this question as learning from mistakes is when our brain grows the most. If there is, then show how you could make the mistake, type in the wrong answer and watch the video response from Paris. There are some excellent mindset sayings and examples in each of the incorrect answer videos that are well worth sharing with the students. - Select the "Watch Again" button and watch the video to show the coaching available if the student answers incorrectly. - Ask for someone to come up and show the correct workings to solve the problem. Explore the concept of x groups of 9 object, with them - Ask them to type in the correct answer and select "Check" - Select the "I've Got This" button to receive your sticker - Select the "Next" button to move onto the next question

- Repeat the above sequence until all 12 questions are answered correctly
- Select the "Flashing Paris sticker" in the middle of the sticker wheel to play the congratulations video
- The Congratulations video will play, and the Paris Sticker will pop into place on the Home Screen as recognition that you have learnt and understand the 9 Times table.
- **NOTE: Within the Congratulations Video, Paris explains that you can also use number sense to solve 9 times by subtracting 1 time from 10 times. If your students are competent in subtraction then it is well worth spending some time to do a number of worked examples on how to use this technique. You may even select the "9 times tile" on the home screen and "Reset" all 12 questions, select "Next" and solve all 9 times questions using this strategy.**

Give your student/class some applause or other form of recognition.

Wrap this activity up by asking the student/group:

- "Do you now feel like can solve 9 times table questions by using your hands and number sense?"

If they feel like they need more practice, then click on the 9 times tile again which will take you to the Progress Screen where you can select the "Reset" button. It will ask if you want to reset. Select "Yes" and then select the "Next" button to start the first question again.

Once the student/class are comfortable that they understand and can solve the 9 times table, then announce "you are now ready to move onto the 3 Times Table".

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30 mins	**<u>Creative Activity – Create your Own 9 Times Poster</u>** This activity is done as individuals or in groups up to 4. "There are a number of ways to solve the 9 times tables and also a number of patterns in the answers. Your task is to design a poster that captures what you have learnt about the 9 times table. Make it colourful and creative. You can include Paris and have her describe how to solve the 9 times in words". " You have 25 minutes to design the poster at which point you can share with the class". Once complete ask the show and talk through their posters. Ask the class to applaud at the end of each demonstration.
	<u>Follow-Up Activity – 9 Times Worksheet</u> The App is designed with the real-life questions as a means of formative assessment to give an indication how each student is learning the material throughout the course. Once the students have demonstrated an understanding of the 9 times tables, there is a worksheet available with 12 different real-life questions to either continue practicing or to use as a means of summative assessment. The worksheets include a space for the students to work out the answers. All worksheets are available for download from the following link: https://educationthroughanimation.com/pages/worksheets