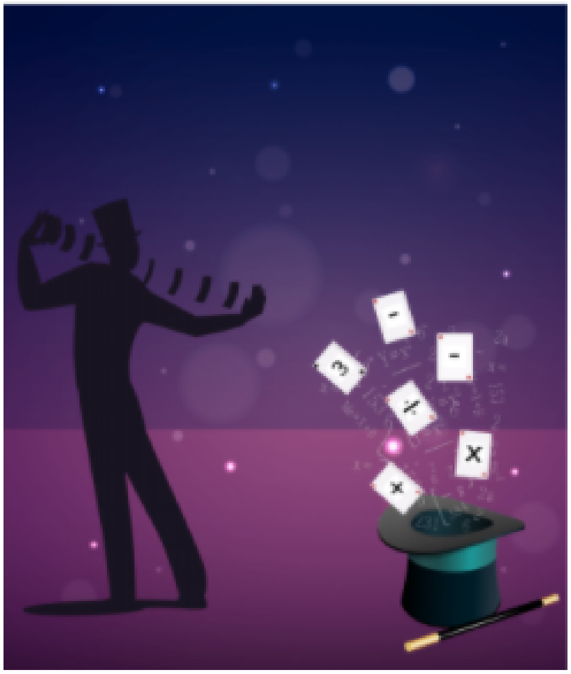

CREATE WITH
MATH


Marvin's Magic
Marvin Dynamo
Hat


# TRIAL CLASS GRADE 7 CWM

# Introduction to Algebra






| Topic | |
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| **Class Description** | **Narrative:** Marvin Dynamo is a world famous magician. People claim that he can bend the laws of mathematics themselves. Let's study his methods and tricks to see how he works.<br><br>**Math backbone: This lesson introduces** the concept of variables and uses them to write down simple algebraic expressions. We learn about the striking similarity between arithmetic (numbers) and algebra (variables). **We also** explore how numbers and variables could be visualized using basic ideas of geometry. **At the end**, the student uses the concepts of algebra to develop a personalized algebraic expression and convert that into a conversational sentence. |
| **Class** | Trial G7 |
| **Class time** | 50 mins |
| **Goal** | 1. (-1) **Recall**<br>Form numeric expressions using numbers and operators (N/A)<br>2. (0) **Core**<br>• Form algebraic expressions using variables, number and operators<br>• Represent square numbers geometrically<br>• Express the areas of rectangles and triangles as algebraic expressions<br>3. (+1) **Advanced**<br>Visualise $(x + y)^2$ geometrically and derive an expression for its expansion<br>4. (+2) **Accelerate:** NA |


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| **Resources Required** | **Teacher Resources**<br>• Earphone with mic<br>• Tablet-Stylus | **Student Resources**<br>• Earphone with mic (Optional)<br>• Paper- Pen<br>• Tablet-Stylus (Optional |
| **Class structure** | 1. Warm-up<br>2. Activity 1<br>3. Activity 2<br>4. Activity 3<br>5. Create<br>6. Wrap Up | 1. 5 mins<br>2. 15 mins<br>3. 10 mins<br>4. 10 mins (Optional)<br>5. 10-12 mins<br>(Use discretion) |

**Warm-up (5 min)**

| Applet Screenshot | Whiteboard (if any) | Learning Experience \| Probing Qs |
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|  | | **Ask:**<br>• Greetings! I am <.....>. How are you today?<br>• Ask the students about their day.<br><br>**Say**:<br>Today we will try to understand **magic in math** and **math in magic**.<br>I like to call it **mathe-magic**! Excited?<br>Let's start!<br><br>For this magic trick, you need to follow certain steps, and keep everything to yourself. Don't tell me anything. You may also write the steps but don't let me see it.<br>Ready? Ok!<br><br>Step 1: Think of any number between 1 to 9.<br>Step 2: Add 3 to it and remember the outcome.<br>Step 3: Now double that. |


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| | | Step 4: Now subtract 4.<br>Step 5: Divide it in half.<br>Step 6: Subtract your original number with which you started!<br><br>**Abra kadabra...or say algebra--kadabra**<br><br>Hmm... You get 1! Right?<br><br>< **Teacher note:** In case students' answer does not come as 1 ><br>**Say**: Oh! You did not get 1? Let's try it again.<br><br>< Repeat the steps 1-9 above until the answer comes as 1 >:<br>Well, once upon a time in a far away land, there was this magician called Marvin Dynamo. He was the one that created this trick. **Marvin Dynamo** claims that he can read minds. He's so confident in his skills that anyone who can see through this magic trick will get to meet him.<br><br>**Say:** Are you curious to know how he did this? What if I told you that by the end of the class you will be able to create your own personalised trick? Are you excited? Let's begin.<br><br>***Probing**:*<br>*1. Do you believe it was magic and I predicted your selection through some telepathy or something?*<br>*a. Magic is nothing. All we do is follow certain math logic.*<br><br>*2. If not, how do you think I did that?*<br>*a. All I used was, simple math!* |


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| | | **Say:** I am already excited to unveil the math behind this trick! It all starts with simple arithmetic!! |


# Activity-1

**Core Concepts** :- Using concept of variables to develop simple algebraic expressions and equations. Connect between arithmetic (numbers) and algebra (variables).

**Activity-1 (15 mins)**

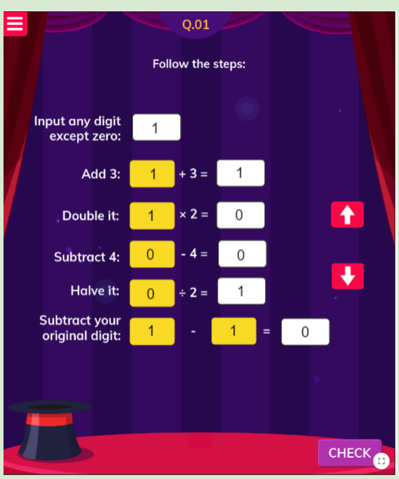
**Mandatory**

- Initiate Screen Share by the student.
- Allow the child to “do” the activities.
- Provide the support where needed.

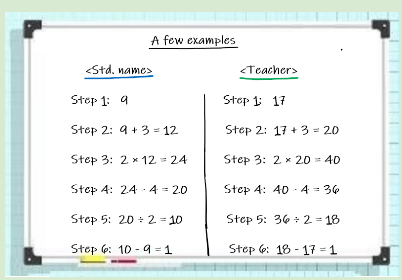
**Narrative Outline:** This was Dynamo’s trick. Did you think I really read your mind? Like with most “magic”, there’s always some kind of “trick” to it. Let's go through what we just did, step by step and see if we can spot how this magic trick works. And let’s do it with a different number this time, since it should have worked with any number between 1 and 9.

**Say:** To know what exactly happened we need to see the process step by step. Let’s do it together and find out ourselves!

**A-1: Q1 -** Follow the steps once again and fill in any number between 1 and 9 to start with. Best if you use some other digit than the one you used previously!




- **WBA**




**Say:** Now let the process begin.

This time we will start parallely i.e me and you both will start with a number of our own choices. Let go step by step for both of us:

**Steps:**

1. Input any number between 1 and 9.
2. Add 3.
3. Double it.
4. Subtract 4.
5. Halve it.
6. Subtract your starting number.

**Say -**

- We both get 1 as a final output, right?
- Point here is we both get the same output irrespective of inputs, so we can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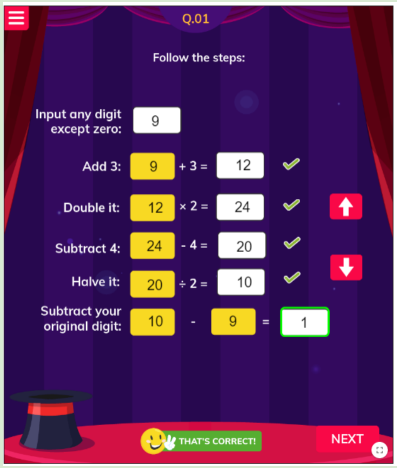


A-1:-Q1
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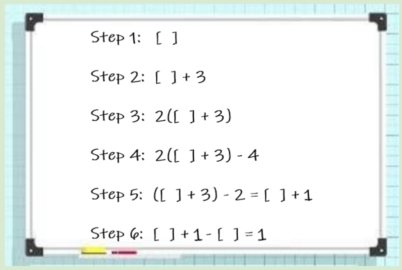

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conclude that the number we choose at the beginning does not affect the output.

- Let me replace it with a symbol like a box for a placeholder.

**Probing:**

1. *What does this box show?*
    a. *Box shows the unknown value.*
2. *Does the value in the box ever affect the output?*
    a. *No, as it gets cancelled at the end.*

**Say:**

We can call it an UNKNOWN!

The focus is on the **UNKNOWN** and you know we can represent the unknown with any alphabet. The most common alphabet used for any unknown value is **“*X*”.**

**FUN FACT:** Yes the same “*X*” we used in the term ***X*- ray** as the rays were also unknown at the time of discovery! Interesting, isn’t it?

We call them variables!

Any alphabet from *a-z* can be used as a variable. “*x*” is a universal variable.

**To add:** We also use some specific variables to
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<tr><td></td><td></td><td>represent specific quantities, like theta ($\theta$) especially for angles!<br><br><b>Probing</b>:<br><i>1. How will you express the sum of 3 and 7?</i><br>• <i>3 + 7</i><br>3 + 7 shows or expresses the sum of 3 and 7. So it is called an <b>arithmetic expression.</b><br><br><b>Say:</b><br>A combination of numbers and operators is known as <b>arithmetic expression</b>.<br>Just to give you a heads up:<br><When you perform arithmetic operations like addition, subtraction, multiplication and division <b>on variables</b>, you get <b>algebraic expression</b>.><br><br><b>Link to next question (LNQ):</b> We have understood the link between Arithmetic expression - Algebraic expression i.e numbers and variables. Move ahead to cement the concept.</td></tr>
<tr><td colspan="3"><u>Knowledge Points/Evidence of Learning:</u> Understanding of variables, constants, operators, arithmetic and algebraic expressions, and their components.</td></tr>
<tr><td colspan="3"><u>Say:</u> It's interesting to see how variables behave like numbers in algebra. Let's see how both arithmetic and algebra are able to convey the same statement in different ways. Keep a watch over variables!</td></tr>
<tr><td colspan="3"><u>A-1:- Q2-</u> Write the final arithmetic and algebraic expression in the input box.</td></tr>
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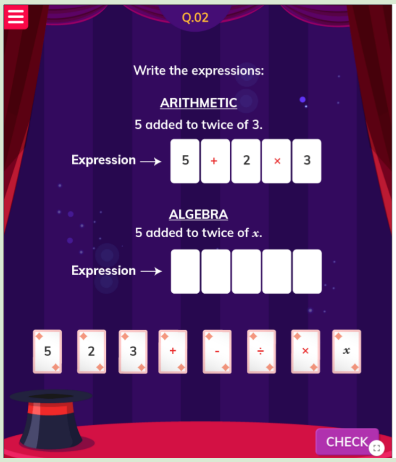


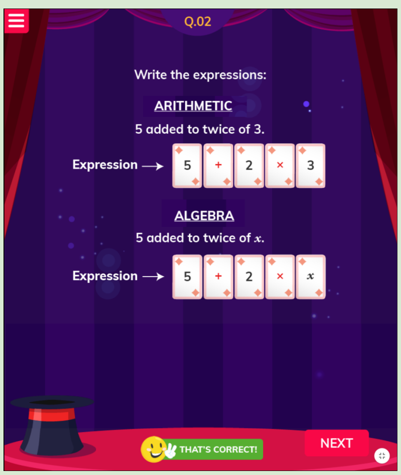


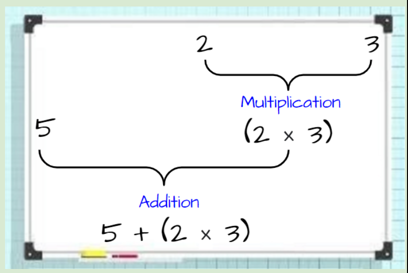


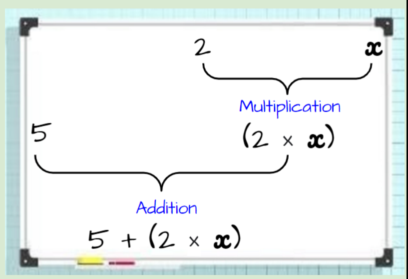


**Note:**

For each of the expressions explain to the students that $x + y$ is the same as $y + x$ and $x$ x $y$ is the same as $y$ x $x$. However, prompt him/her to enter the answer as suggested in the lesson plan.

**Say -**

**Concept Explanation:**

What is three more than 5?

- (5 + 3)

What do you mean by twice?

- Multiplying by 2

What will be twice of 3? 4? 6?

- (2 x 3, 2 x 4, 2 x 6)

What will be twice of a number $y$?

- (2 x $y$)

Now:

**Here, 5 is added to twice of 3.**

**Note: To reset: Click hamburger button and then reset button to start/refresh the question.**

How will you show twice of 3?

2 x 3

How will you show that 5 is added to twice of 3?

5 + 2 x 3. ***AUTOFILLED**

Arithmetic expression is 5 + 2 x 3

Now, how will you show that 5 is added to twice of 4?

5 + 2 x 4

| | | |
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| | | How will you show that 5 is added to twice of 6?<br><br>5 + 2 x 6<br><br>How will you show that 5 is added to twice of 7?<br><br>5 + 2 x 7<br><br>How will you show that 5 is added to twice of $x$?<br><br>5 + 2 x $x$<br><br>*This can be written as 5 + 2$x$.*<br><br>**Teachers note**: If a student writes the answer as 2 x $x$ + 5 or $x$ x 2 + 5 explain to him/her that they are the same thing but make the student enter 5 + 2 x $x$ ONLY!<br><br>**Do:** Click and drop the correct input.<br><br>Algebraic expression is 5 + 2$x$<br>The only difference is in the algebraic expression.<br>We have an unknown as "$x$" which is a variable.<br><br>*Probing:*<br>*1. How will you say this in day to day life:*<br>*Ben eats 5 more than twice the cookies eaten by boko!*<br>*a. Ben = 5 + 2 boko*<br><br>*2. Can you think of any other real life situation where you can fit this expression?*<br>*a. Open ended answer.* |


**Knowledge Points/Evidence of Learning:** Difference between arithmetic and an algebraic expression. Visualizing AE in real life!

**Concept Explanation:** There can be more than one variable in an algebraic expression. Let us form some expressions using two variables.

How will you express the sum of 4 and 8?

- 4 + 8

How will you express the sum of $x$ and 8?

- $x + 8$

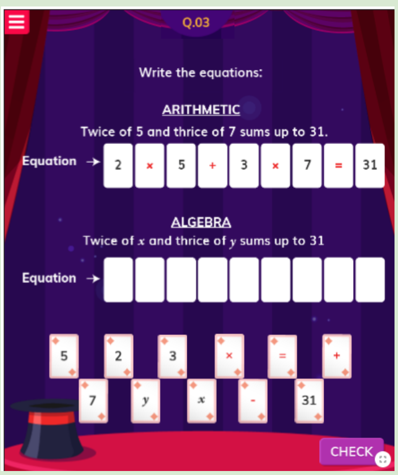
How will you express the sum of $x$ and $y$?

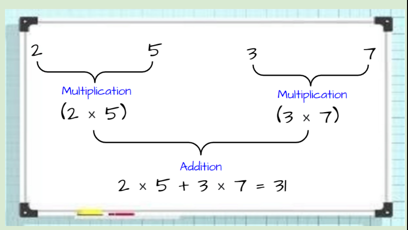
- $x + y$

$(x + y)$ is an algebraic expression in two variables $x$ and $y$.

Let us form more such expressions.

**A-1:- Q3 -** Write the final arithmetic and algebraic equations in the input box.




**Say -**

How will you show twice of 5?

- 2 x 5

How will you show thrice of 7?

- 3 x 7

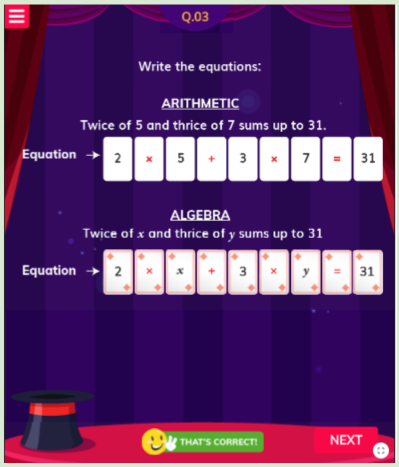
How will you show the sum of the two expressions obtained?

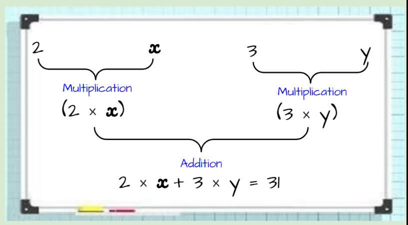
- 2 x 5 + 3 x 7

What is the value of this expression?

- 31

How do you write this as an equation?




- 2 x 5 + 3 x 7 = 31 ***AUTOFILLED**

**Say:** This is called an **arithmetic equation**. It shows that the value of **10 plus 21** equals **31**.

Now see again:

How will you show twice the $x$?

- 2 x $x$

How will you show thrice of $y$?

- $3 \times y$

How will you show the sum of the two expressions obtained?

- $2 \times x + 3 \times y$

What is the value of this expression?

- 31

How do you write this as an equation?

- $2 \times x + 3 \times y = 31$

**Teachers note:**
\If a student writes the answer as 2$x$ + 3y = 31 or 3y + 2$x$ = 31 or 31 = 2$x$ + 3y etc. explain to him/her that they are the same thing but make the student enter 2$x$ + 3y = 31 ONLY!

Say: This is an **algebraic equation**.

An algebraic equation has 3 parts. Left Hand Side expression (LHS), sign of quality (=) and Right and side expression (RHS).

What is LHS in $2x + 3y = 31$?

- $2x + 3y$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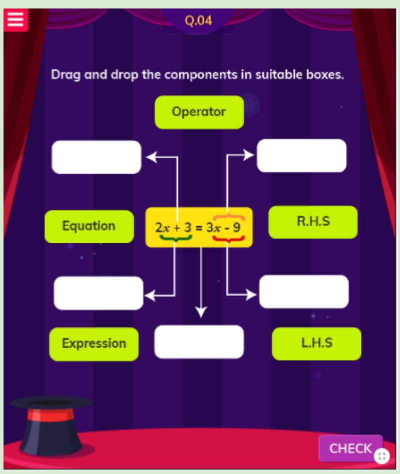
<tr><td></td><td></td><td>What is RHS?<ul><li>31</li></ul>Do: Click and drop the correct input.</td></tr>
<tr><td colspan="3"><u>Knowledge Points/Evidence of Learning:</u> Difference between arithmetic and an algebraic expression. Visualizing AE in real life!</td></tr>
<tr><td colspan="3"><u>Say:</u> Algebraic equations can be formed when two expressions are “equated”, example:<ul><li>5p + 7 = 3p</li><li>$4x$ -3$y$ = $2x$ + 5</li></ul>Let’s try to identify the parts of such equations.</td></tr>
<tr><td colspan="3"><u>A-1:- Q4 -</u> Drag and drop the various components in correct places.</td></tr>
<tr><td>
</td><td></td><td><u>Say -</u><br><br>What is the LHS in the given equation?<ul><li>$2x$ + 3</li></ul>What is the RHS in the given equation?<ul><li>$3x$ - 9</li></ul>How many expressions are there in the given equation?<ul><li>Two</li></ul>What are these two expressions?<ul><li>$2x$ + 3</li><li>$3x$ - 9</li></ul>What is the complete equation?<ul><li>$2x$ + 3 = $3x$ - 9</li></ul>Do: Drag and drop the correct input.</td></tr>
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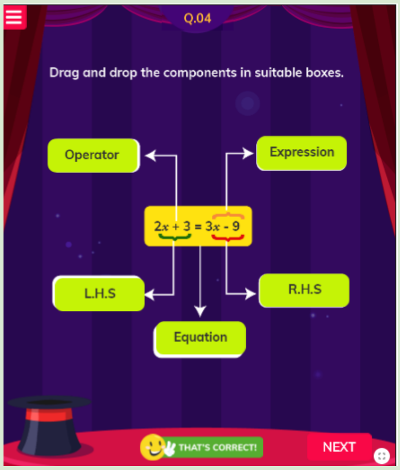


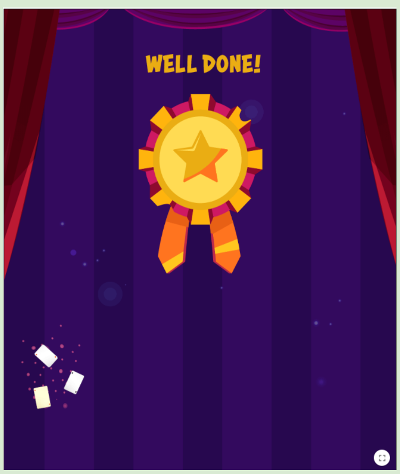


**Knowledge Points/Evidence of Learning:** Students understand the exact difference between algebraic expression and equations. The connection between arithmetic and algebra.

**Narrative Outline:** We've seen through Marvin Dynamo's trick! Now you see the math behind the magic.




# Activity-2

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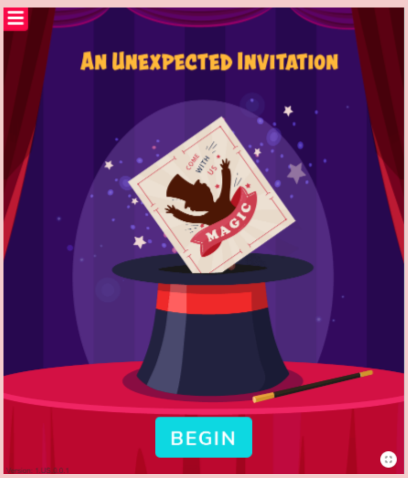
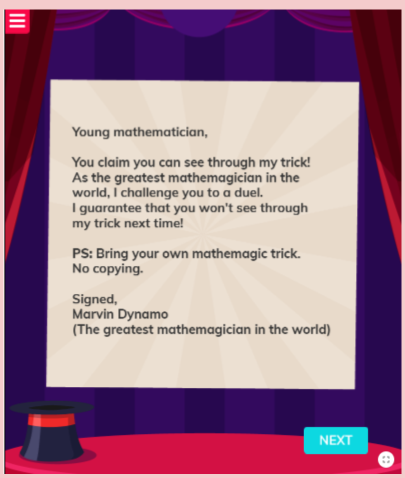
| **Activity-2** (10 mins)<br>● Mandatory activity. |
| **Narrative Outline:** Marvin Dynamo has heard of how you saw through his trick and now wishes to challenge you with another. Before we go meet him, we need to prepare ourselves! Dynamo seems to understand how algebra, arithmetic, and geometry are related very well. If we want to stand a chance against him, we need to be able to do the same! |




**Say:** We have seen how algebra and arithmetic are alike! In fact, the beauty of algebra lies in the way we can visualise them!
Now, let's try to connect arithmetic, algebra and geometry!

**<Write on the whiteboard>**

Let's begin by observing these numbers -

**1, 4, 9, 16, 25, ....**

- Do you see any pattern?


<Expected answer - if students found out the pattern, appreciate and proceed. If not, show them that these are 1^2, 2^2, etc.>

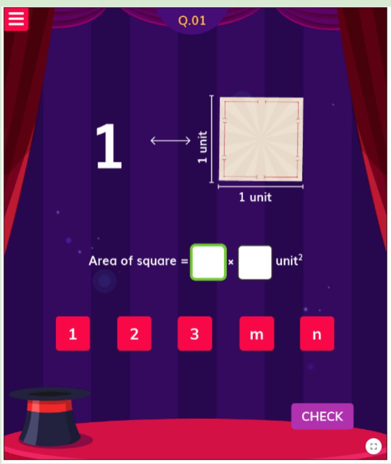
- Can you predict the next number?

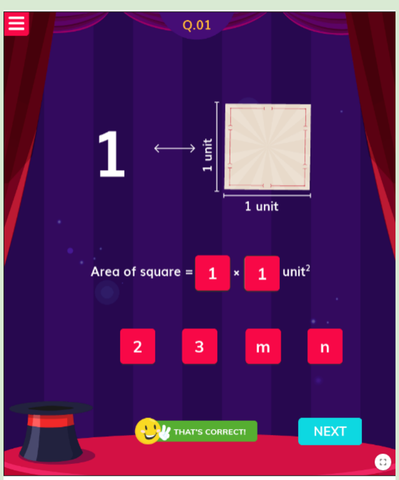
Yes, it would be 6^2, which is 36.

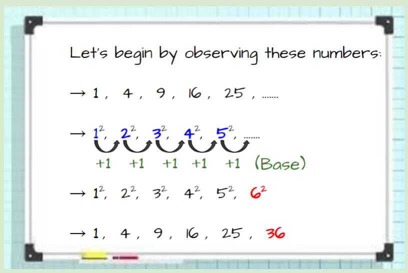
In fact, these are called “square” numbers. Why do you think these are called square numbers?

Let’s find out.

**<u>A-2: Q1 -</u>** How will we express the first square number i.e 1 geometrically?




**<u>Say -</u>**
Let’s take the first square number, 1.

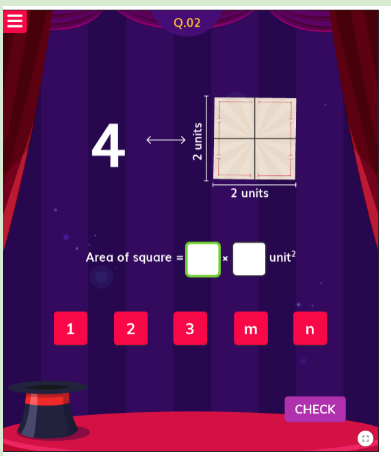
Can we represent this as the AREA of a geometric shape - which is a square - of side 1 unit?

Why only a square? Hold on to that thought, we will start observing more on this.

So, this is a 1 by 1 square, with area = 1 times 1 or 1 unit squares..

**Do:** Type in the numbers.

**Note: To reset: Click hamburger button and then reset button to start/refresh the question.**


<table>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3"><u>Knowledge Points/Evidence of Learning:</u> A perfect square number can be represented geometrically as a square.</td></tr>
<tr><td colspan="3"><u>A-2: Q2-</u> How will we express the next square number ‘4’ geometrically or in terms of unit square?</td></tr>
<tr><td>


</td><td></td><td><u>Say -</u><br>Next, let’s take 4, the next square number. I can now take 4 of those 1 × 1 squares earlier; and arrange it into another bigger square. What is the side of this square now?<br><br>It is 2. Observe - that 4 is the second square number.<br>Do: Type in the numbers.</td></tr>
<tr><td colspan="3"><u>Knowledge Points/Evidence of Learning:</u> A perfect square number can be represented geometrically as a square.</td></tr>
<tr><td colspan="3"><u>A-2: Q3 -</u> How will we express any square number algebraically?</td></tr>
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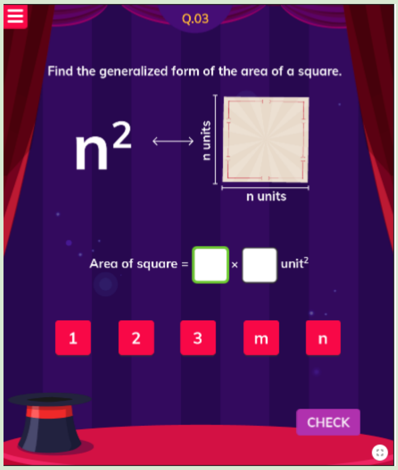


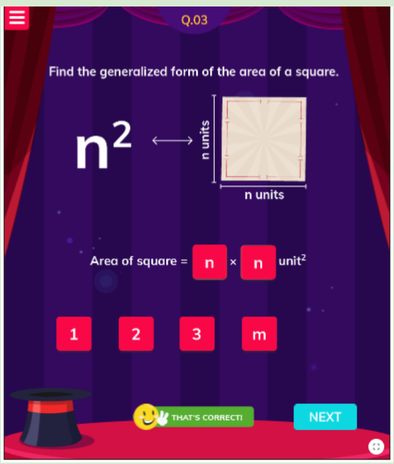


**Say -**

If the length of the side of a square is represented by n, how will you represent its area?

- $n^2$

How will you express $n^2$ using the multiplication operator?

- $n \times n$

**Do:** Type in the variable.

By extending the logic that we saw till now, if we take the nth square number, how can we visualise it?

So , nth square number, or $n^2$ can be seen as a square, of side "n".

**Probing:**

Now, what will be the area of a square of side n?

- It is $n^2$ - which is the nth square number.

Do you now see WHY these numbers are called square numbers?

- Because they are derived from the area of a square.


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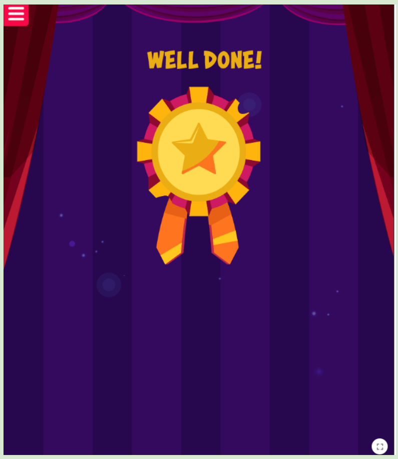
|  | | **IMP:**<br>**We started with numbers, visualised them as areas of squares, and then generalised them using algebra.** In other words, we saw **numbers evolve into figures and figures evolve into variables.**<br><br>So far, we've been writing this as n times n. That is because we know that the sides of a square are the same - hence we used the same variable. |
| **<u>Knowledge Points/Evidence of Learning:</u>** A perfect square number can be represented geometrically as a square. | | |
| **Narrative Outline:** Now that you know how algebra, arithmetic, and geometry are related, you're well prepared to face Marvin Dynamo's challenge! | | |

# Advanced Activities - A-3

| **Advanced Activity - Concepts: Visualization of algebraic identity $(x+y)^2 = x^2 + 2xy + y^2$** |
|---|
| **Advance Activity 3**<br>● Optional.<br>● Start only after more than 15 minutes on the clock.<br>● Skip to Create Activity if only 10 minutes left. |
| **Narrative Outline:**<br><br><br>It's time for a face off with Marvin Dynamo himself. To protect his pride as a magician with unsolvable tricks, he's given you a challenge, he claims that he can make numbers disappear! And to prove it, he's shown you this mathematical expression he just made. |
| **<u>Say:</u>**<br>Before we go any further, let me start with a simple question -<br><br>What is the value of $(3 + 4)^2$?<br>● **<Expected outcome 1: $3^2 + 4^2$ >**<br><br>Let's see if that is correct or not: $(3+4)^2$ is nothing but $7^2$. What is 7 squared? It is 49. But $3^2 + 4^2 = 25$, and not 49! So |

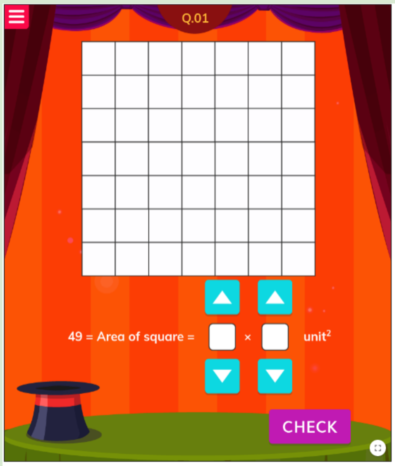

where did the balance of 24 go? >

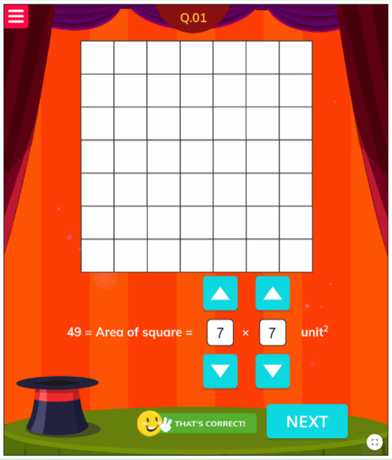
- **<outcome 2: 49 >**

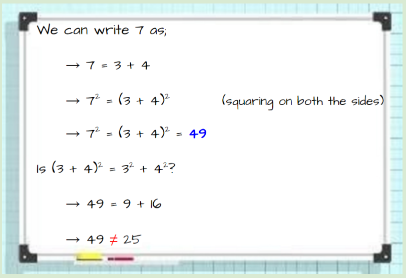
That is correct! But then, why do you think, $(3+4)^2$ is NOT equal to $3^2 + 4^2$?
In fact, $3^2 + 4^2$ is equal to 25 and not 49! So where did the balance of 24 go?

Let's take a look at this.

**AA-3 Q1 -** Find the area of the given square of side 7 units.
Let's explore the square of the sum of two numbers in detail!



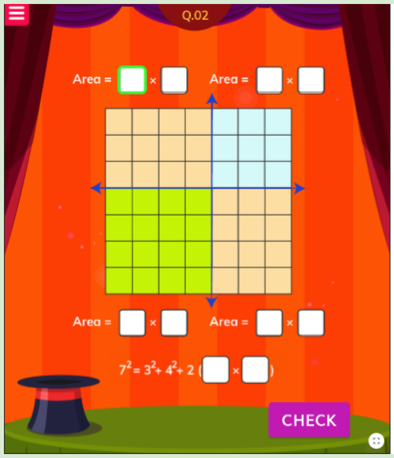

**Say -**

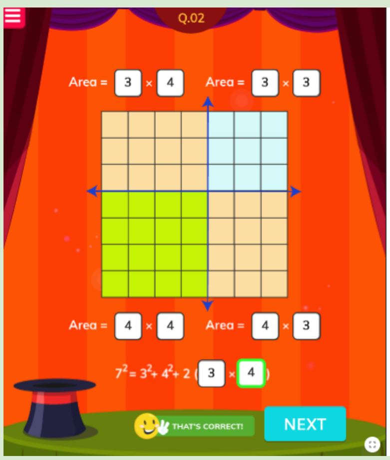
- Take a look at the figure - we have here, a 7 x 7 square - that consists of 49 small squares. This represents the number 49. We now need to IDENTIFY the $3^2$ and $4^2$ regions, within the 7x7 square.
- Can you try finding these?

**Knowledge Points/Evidence of Learning:** Visualise $7^2$ geometrically.

**Say:** Now we have a square of desired area (49 unit$^2$). Let's look for all the regions!

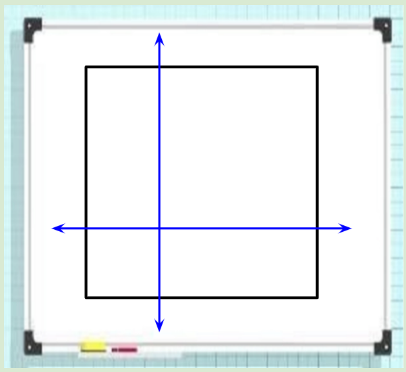

**AA-3: Q2-** Looking at the figure, identify the areas of each region, separated by the horizontal and vertical lines.

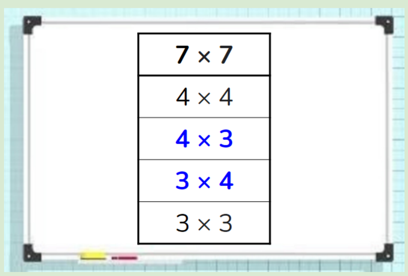



AA-Q2

<White Board>






**Say -**

- Now, let's see this situation again.
- Here, we have the region 7x7 divided as shown. It gives us 4 regions.
- Watch carefully the area of different regions thus produced.
- What do you see?

**Steps -**

- The top right corner has a length of 3 units and width of 3 units. The area would be 3 x 3.
- The bottom left corner has a length of 4 units and width of 4 units. The area would be 4x4.
- **So, we have found out the $3^2$ and $4^2$ blocks - do you see that there are 2 more rectangular blocks that we have not accounted for? Yes - these are the missing pieces! Now, let's find out their areas as well.**
- The top left corner has a length of 4 units and width of 3 units. The area would be 4x3 units.
- Similarly, the bottom right corner has a width of 3 units and length of 4 units. Its area would be 3 x 4. So, we have filled up the areas of these regions

**Do.** Click on numbers (3 or 4) and the numbers will get filled as per highlighted input boxes!

**Say -**

- Can you recap and point me to the missing pieces?
    - Expected student response: 3x4 and 4x3
- That's right!

**Probing:**

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<tr>
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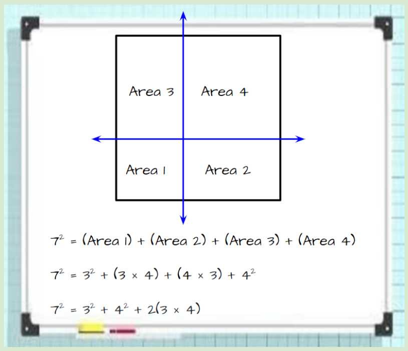
<td>
</td>
<td>

1. *Can you visualise the rectangles formed?*
    a. *Yes! Two rectangles along with two squares.*

**<u>Steps -</u>**

- Here we get closer to simplifying the terms found for $7^2$ expressed as $(4 + 3)^2$. This is equal to
    b. $4^2 + 3^2 + 3 \times 4 + 4 \times 3$
- Further simplified this becomes
    c. $4^2 + 3^2 + 2 \times 4 \times 3$

**Probing:**

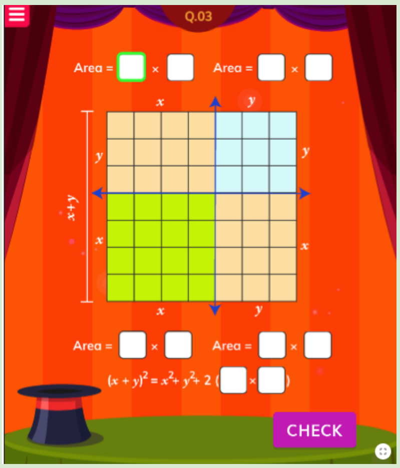
1. *You have expressed $7^2$ using 4 and 3 to get $4^2 + 3^2 + 2(4 \times 3)$, can you express it using other numbers?*
    a. Yes ! $7^2$ can be expressed using 1 and 6 as well as 2 and 5.

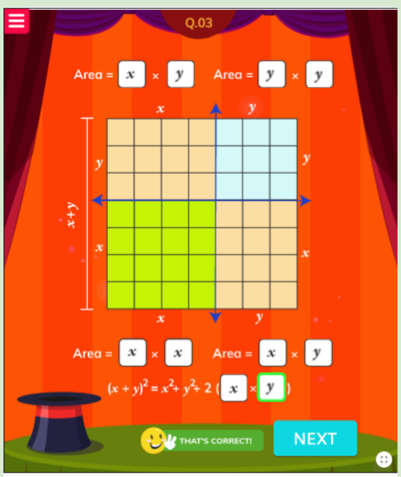
2. If yes! Then can we write the arithmetic equation for the same?

- Yes!<br>$7^2 = 1^2 + 6^2 + 2 \times 1 \times 6$
- $7^2 = 2^2 + 5^2 + 2 \times 2 \times 5$

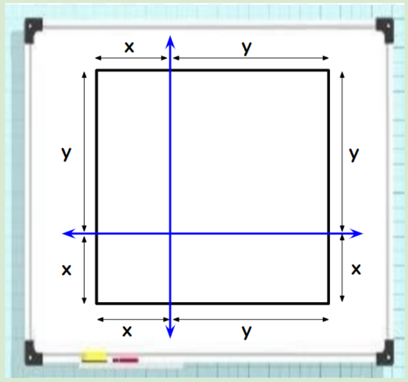
</td>
</tr>
<tr>
<td colspan="3"><u>Knowledge Points/Evidence of Learning:</u> Visualise $7^2$ geometrically and derive an expression for its expansion.</td>
</tr>
</table>

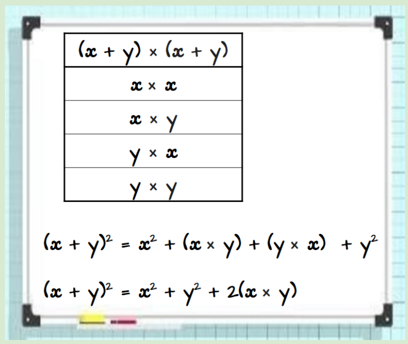
| |
|---|
| **<u>AA-3: Q3-</u>** Form an algebraic equation to give a generalised form. |






**Say -**

- *Can you write an arithmetic equation for the area of the entire 7x7 square?*
  - *Yes! It can be 4 x 4 + 3 x 3 + 4 x 3 + 4 x 3 = 49.*

- In place of numbers 3 & 4 we are using $x$ and y and finding the value of $(x+y)^2$
- Let's now see if we can generalize this.

**Steps -**

- Let's start from the bottom left corner (square). The length is $x$ and the width is also $x$. The area of this corner is $x^2$.
- The top left corner (rectangle) has length of $x$ and width of y and the area is $xy$,.
- The top right corner (square) has length of $y$, and width of y and the area is $y$,$^2$.
- The bottom right corner (rectangle) has length of $y$ and width of $x$ and the area is $yx$. or $xy$, both being the same.
- **So $(x+y)^2 = x^2 + y^2 + 2xy$**

Did you observe that what we have here is an equation?

There is a speciality about this equation. This equation is true for ANY values that you can think of. You can try this out <get student to pick any values for $x$ and $y$, plug into the equation and solve> - it will work for ANY number. Such equations which are true for ANY number - they have a special name. They are called **algebraic identities**.

**Probing:**

1. *Is $(x+y)^2 = x^2 + y^2 + 2xy$ true for any values of "$x$" & "$y$"?*
   a. *Yes! Identity is an equation that is true no matter what values are chosen for "$x$" & "$y$".*


| **Knowledge Points/Evidence of Learning:** |
| --- |
| **Narrative Outline**: You've done it! You've seen through Marvin Dynamo's greatest trick! The numbers weren't missing after all! |

## Create Activity - CA

**Create Activity (12 mins)**

- This is a compulsory activity.
- Allow the children to carry out the activity on their own.

**Narrative Outline:** You did it! You beat Dynamo at his own game, and he's accepted defeat. Now, he wishes to see whether you truly can come up with these completely new mathemagic tricks by yourself. Let's show him, and the world how!

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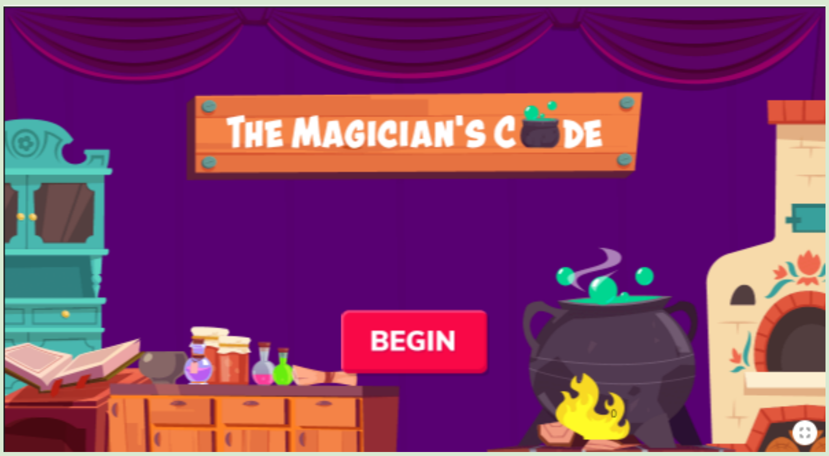
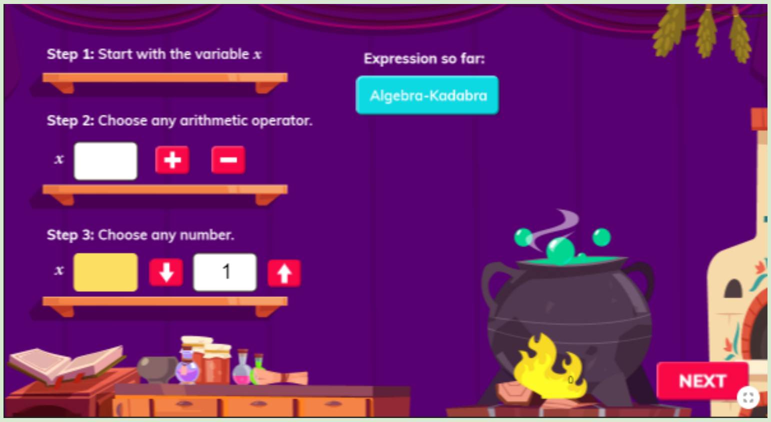
<td>

<br><Whiteboard(s)></td>
<td>Say:
<ul>
<li>Now it's time to use the class deliverables to create something on our own!</li>
<li>Let's create a unique math trick personal to you only!</li>
<li>Note: Here we will do many operations where we add/subtract/multiply and also divide. The focus must be that the variable we started with must get cancelled at the end leaving a constant term only. That means we must focus on multiplication and then division to nullify the effect.</li>
<li>Point to be noted is this will be your own trick so keep asking/replying WHY's so that you know the reasons behind every step!</li>
</ul>
Do:
<ul>
<li>Press "Begin"</li>
</ul></td>
</tr>
<tr>
<td></td>
<td>Say:
<ul>
<li>To start with, you have to choose any variable.</li>
<li>WHY: This variable will attain the value</li>
</ul></td>
</tr>
</table>






(digit) that any person will think of.

- Choose "+" if you want to add a number or "-" if you want to subtract a number as a second step, and then choose a number too.
- **WHY:** Adding/subtracting constant from a variable to represent the trick as a complex process/to deviate from the actual logic of multiplying and dividing with the same number..

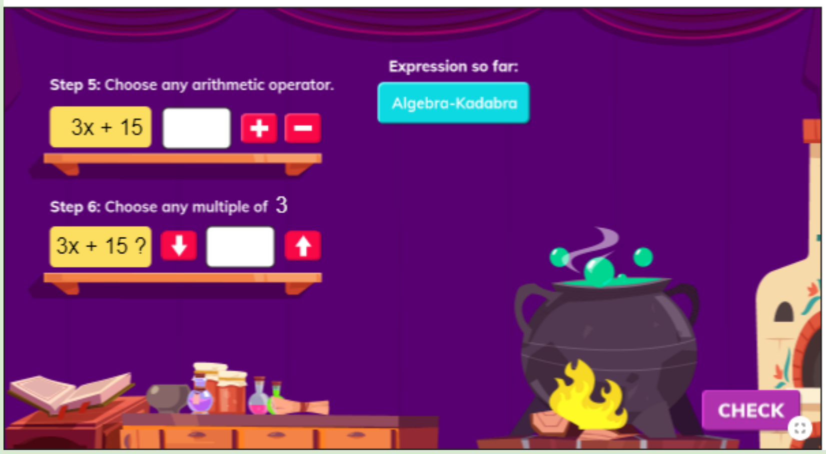
- **Do:** Input operator and number and then press **Algebra-kadabra** to get the expression so far!

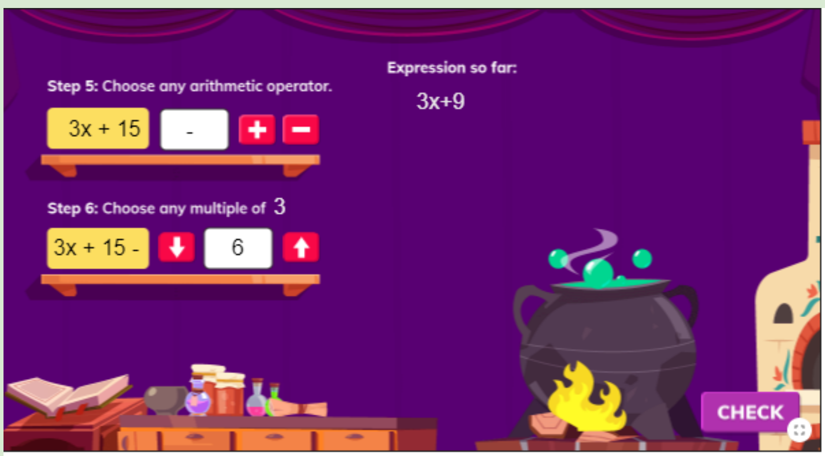
**Say:**

- Now, choose a multiplier with which you want to multiply the whole expression.
- **IMP:** This multiplier is very important.
- **WHY:** Because we will add or subtract now onwards  keeping this multiplier in mind. We will only add/subtract a **multiple of this multiplier** example if M=3 we will add/subtract 3,6,9,12 etc. only,  so as to avoid fractions at the end. Preferably don't use the multiplier itself..**why**?simple... same number must not be used to keep the person engaged and unaware!
  Next, we will divide at the end with this same multiplier to remove the coefficient with our variable so anyways **two usages of the same multiplier is unavoidable!**

- **FUN fact:** but you have to do all this as if you are speaking some random numbers!! It's a magic trick after all!

**Say:**


Again choose "+" if you want to add a number or "-" if you want to subtract a number in the next step.

**Caution:** Choose any **multiple of your multiplier** ONLY as discussed above.
**WHY:** . When we will divide by the multiplier everything in the numerator must cancel down perfectly leaving no remainders.

**Do:** Input operator and number and then press **Algebra-kadabra** to get the expression so far!

**Say:**
Now divide the expression with the same multiplier you use previously.

**WHY:** This will remove the coefficient (multiplier) attached with the variable in earlier steps. This way we will have a solo variable which will be removed when we subtract the original number at the end!

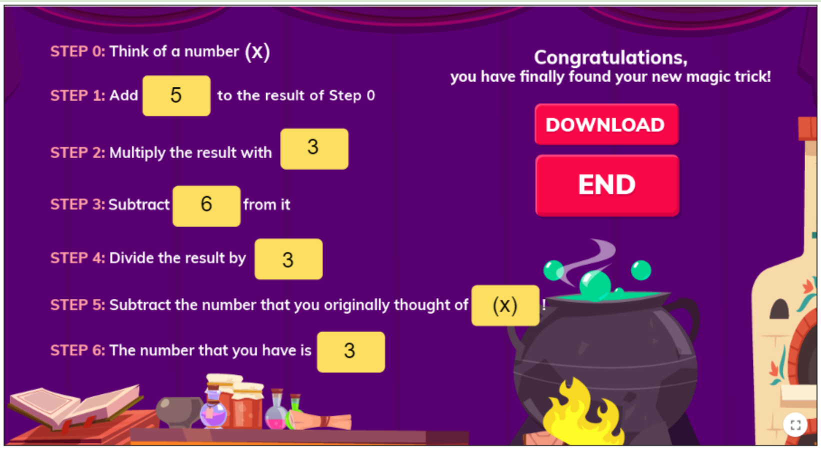
- **Do:** Input number in denominator and then press **Algebra-kadabra** to get the expression so far!

And as a last step subtract the variable (the digit someone will think) leaving a **solo constant term....**

**Say**:
*How to play this trick--------*
1. Think of a number.....
2. Add/subtract.......
3. Multiply(y)..........
4. Add/subtract(ky)......
5. Divide(y)........
6. Subtract original number.

*:D Act as if you are calculating....and then suddenly*






7. You must have...constant..

I hope you really enjoyed the session and you will remember your personalized math trick and have fun!

**Say**:

- Why don't we share this with your family too. Could you please ask your parents to join us?

- Hello sir/madam, I am your child's math teacher for today. Thank you for joining us so you can see for yourself the wonderful things that <student name> achieved today.

- <Student name>, please open the picture you downloaded. Let's tell your parents what you created today? Talk about the math concepts you learnt.

**Step:**

- Ask student to click on DOWNLOAD button

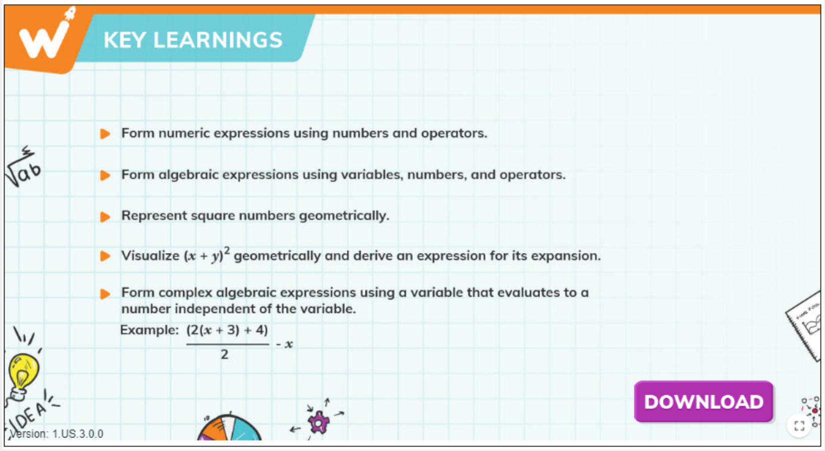
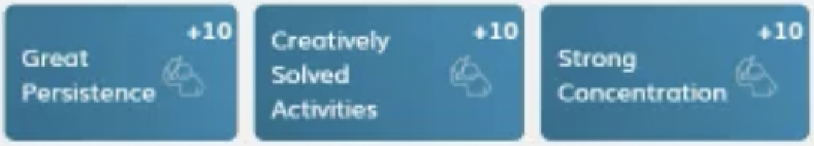
**Narrative Outline:** I don't think magic actually exists. What does exist, are sequences of logical steps executed smoothly! Now it's up to you to do it as smoothly as you can and dazzle your friends!

## Wrap Up

Wrap Up (5 min)

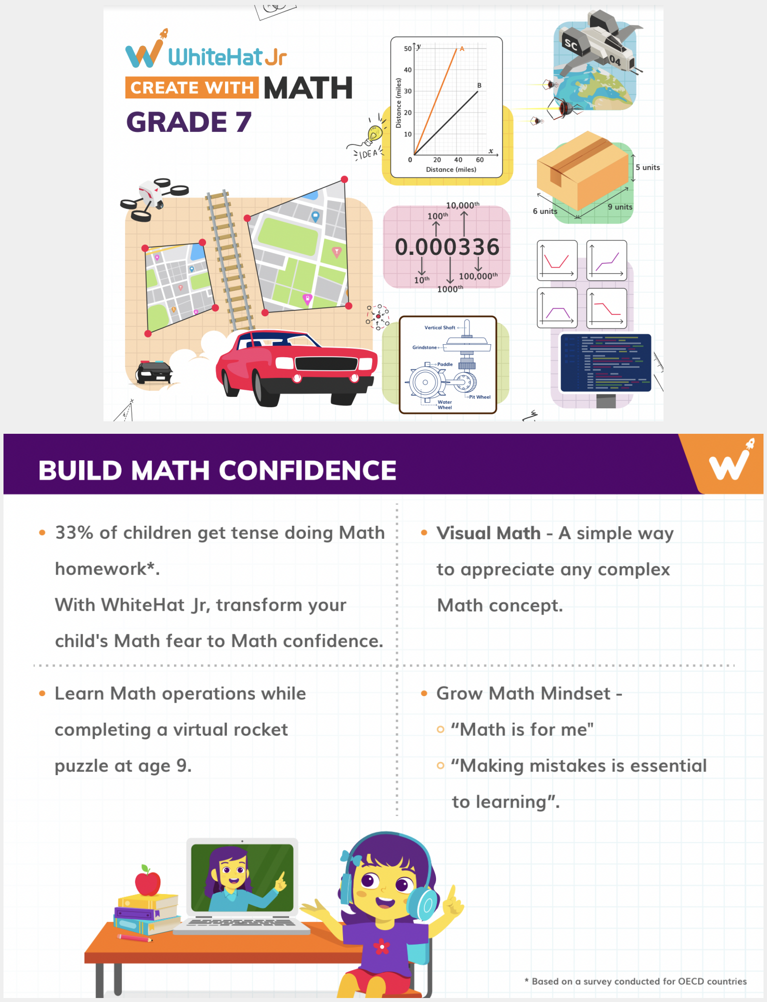
**Compulsory**

- Reflection
- Summary
- Hats off

| | |
|---|---|
| <br> | Great job today. Let's revisit the key learnings of the class.<br><br>(Give 3 hats off)<br><br>Here is a Hats Off for being so creative in the class today.<br><br>It was amazing to see you not give up and solve difficult questions!<br>Press the Hats Off Icon for ***Great Persistence.***<br><br>You were super creative to build the project.<br>Here is the Hats off for ***Creatively Solved Activities.***<br><br>I really liked that you stayed focused through the class.<br>Press the Hats Off Icon for ***Strong Concentration.*** |

# Product Wrap Up Pitch

| | |
|---|---|
| Product Wrap Up Pitch (5 min)<br>**Compulsory**<br>• Program Information and Features | |
| | <u>**Say:**</u><br>You must be very proud of <student name> for earning 3 out of 3 hats off in the trial class itself! It has been a delight to take this class.<br><br>I would love 5 minutes of your time to walk you through the Create with Math course.<br><u>**Steps:**</u><br>• Click on the link to open **Visual Aid** in new tab<br>• Share screen and confirm that parent can |


see the visual aid

**Say:**

The Create with Math course is based on leading-edge research, so <student name> can become math confident for life!

Did you know? Based on a 2012 Survey with 34 participating OECD countries, 33% of children get tensed doing math homework?

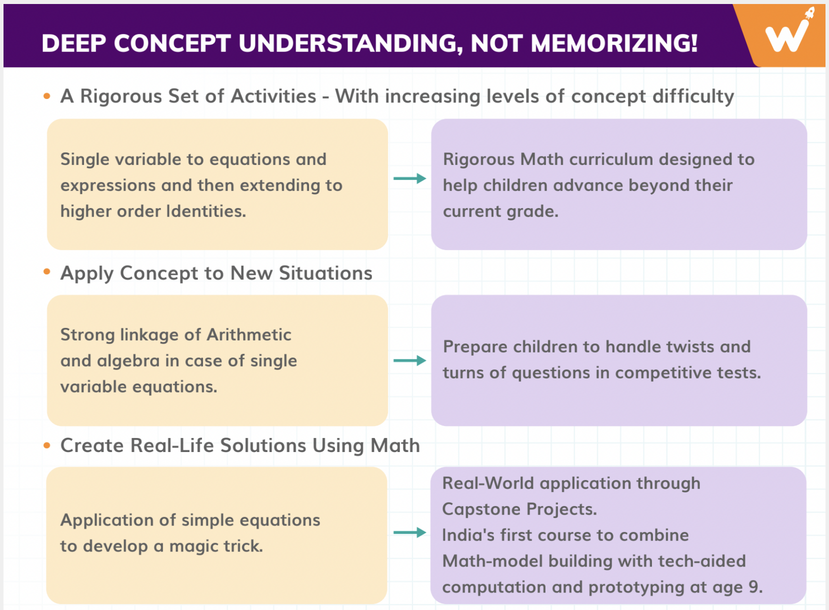
As a math teacher, I have seen that many students dislike math - our objective is to transform <student name>'s math fear into math confidence! We want to hear <student name> say "math is for me" instead of "I am not a math person". We want <student name> to say "making mistakes is essential to learning" - this is what separates the highest achievers in math from the average learners.

We will accomplish this, using visual models so that <student name> can learn even complex math concepts! To give you an example, <student name> will complete a virtual rocket puzzle to learn and apply different mathematical operations at age 9. Our use of visual mathematics makes classes enjoyable and memorable for students!

**Say:**

We want to build a strong math foundation for <student name>. Our curriculum includes rigorous activities of increasing difficulty levels such as introducing single variables equations and then extending to higher-order identities. These higher-level math concepts are covered to help <student name> advance beyond his/her peers and grade level.

We encourage students to apply math concepts to new situations such as linking arithmetic with

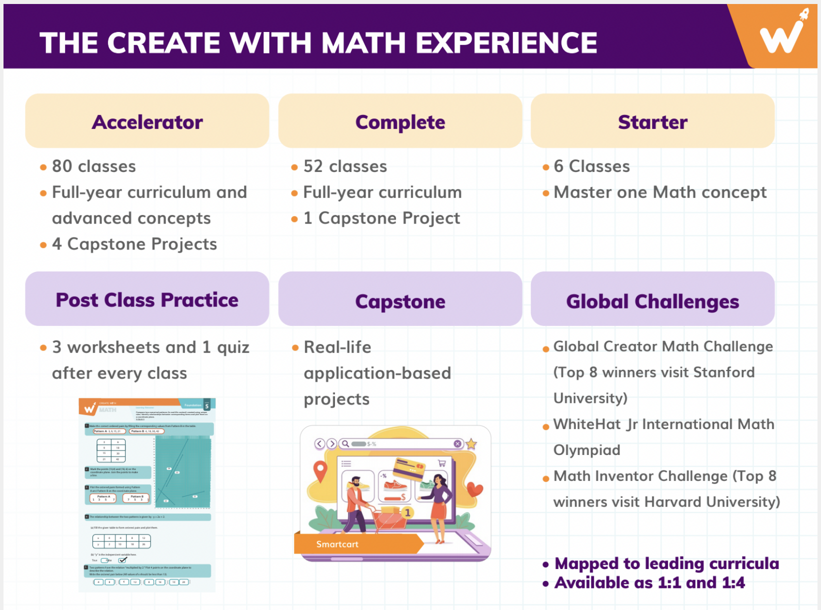

algebra in single variable equations. This prepares <student name> to handle twisted questions which are pretty common in:
*For India say:* competitive exams such as IAS and IIT in the near future.
For *Outside India say:* competitive tests such as SATs (pronounced "ess A tees") and Math Olympiads.

Create with Math students learn math to succeed in school as well as outside of school - that is why the real-life application of math is a key feature of our program. For example, applying simple equations to develop a magic trick. Create with Math is India's first course to introduce Capstone Projects - which combine math model building and computer-aided computation at such a young age.

**Say:**
The full 'Create with Math' curriculum is made up of **80 classes split into 11 modules,** which cover core and advanced math concepts as well as Capstone Projects. I would love for <student name> to join us in the full course so s/he can continue to marvel us here with his/her brilliant mind. You can also choose from our range of starter and complete packages.

Whatever the package, our entire curriculum is mapped to the leading curriculum. The topics covered in our classes will be compatible with the <name of curriculum used in student's school>.

You can enrol for 1:1 classes, where I will give 100% of my personalized attention to <student name>, or choose 1:4 classes where <student


name> can learn and collaborate along with 3 other students.

Before I end, let me highlight some of the additional features of the Create with Math program.

Learning does not stop with classes; we give <student name> 30 to 60 minutes of **curated post-class practice content** - worksheets and quizzes to be completed independently. You will receive samples of practice sheets as part of this trial class as well.

I would encourage you to find out more about the Capstone Projects as you consider this program. <student name> would thoroughly enjoy these!

In addition to making <student name> fall in love with learning math, we will be providing some great exposure and opportunities. There are multiple challenges that <student name> will get to participate in at different stages of the 80 class program.
Within 2 months, 10,000+ students across 5 countries enrolled in Create with Math - all of them on their way to becoming math confident for life. I look forward to <student name>'s continuing his/her unique learning experience with us.

*If the parent asks questions, use the additional slides from the appendix to give more information in the given time. If there is not sufficient time to answer questions, defer the questions to the Advisor.*

**Say:**

Thank you very much for your time. A **Create with Math Advisor** will call you to speak about <student name> in greater detail.



# Applet Links

**GGB Links for the activities**

| Activity | Activity Name | Links |
|---|---|---|
| Activity 1 | Algebra-kadabra | https://www.geogebra.org/m/ggfsxebx |
| Activity 2 | An Unexpected Invitation | https://www.geogebra.org/m/mstfckde |
| Advance Activity 3 | Algebra kadabra -2 | https://www.geogebra.org/m/kpfe3mh7 |
| Create Activity | The magician's code | https://whitehatjrcontent.s3.ap-south-1.amazonaws.com/Teacher-Resources/COCOS_Applets/explore/LPCAbuild/Trial+G7G8+CA/web-mobile+ |

| | | |
|---|---|---|
| | | 2/index.html |
| Wrap Up | NA | https://whitehatjrcontent.s3.ap-south-1.amazonaws.com/Teacher-Resources/COCOS_Applets/explore/prodwrapup/G7wrap/index.html |