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Making Assistive Technology Heroes

Accessing the Louisiana Student Standards for Mathematics through the use of low, mid, and high tech tools and resources.

DEPARTMENT of EDUCATION
Louisiana Believes

Louisiana Assistive Technology Initiative

www.laticenters.org

Today's Goals

By the end of this session participants will be able to:

- Adapt and individualize Louisiana Students Standards for Mathematics through the use of low, mid, and high assistive technology tools and resources.
- Identify assistive technologies available to support general education curriculum access and participation for Students with Disabilities (SWD).
- Universally design learning opportunities for ALL students (UDL principles).

Louisiana Student Standards for Mathematics

Measurement and Data

2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

-1.MD.A.2 (*2nd Grade Remediation Guide*) Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.

🔗**LC. 2.MD.A.1a** Select appropriate tool and unit of measurement to measure an object (ruler or yardstick; inches or feet).

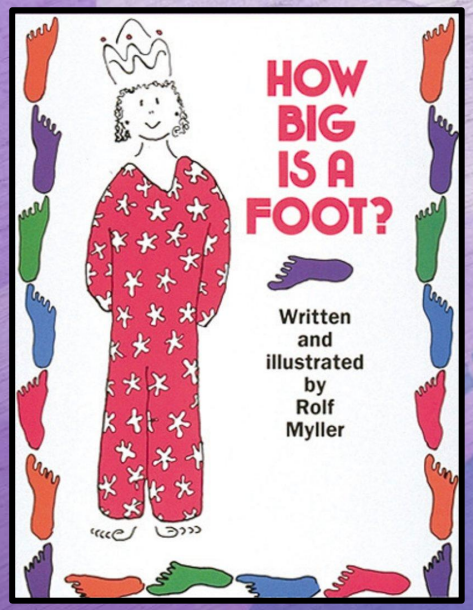
🔗**LC. 2.MD.A.1b** Select appropriate tools and demonstrate or identify appropriate measuring techniques.

🔗(LC=Louisiana Connectors)

LESSON: Measurement

Illustrative Mathematics

2nd Grade Illustrative Math



Part 2

Task: Determining Length

a.
Have one student from each pair stand on a blank sheet of paper and have his/her partner make a mark at the student's heel and another at the toe.

b.
Then, together, have the pair measure the distance between the two marks to determine the length of the first student's foot and record the length. Students may have to find the closest unit.

c.
Have students then find the difference between the estimation and actual length.

d.
Repeat with the second student, using a different color to make the marks. The second student should stand at the same endpoint as the first student so that students can visually compare the two representations and compare the number of the distance in units in part three.

High Incidence Supports

Activity:

Have a pair of students measure the length of each student's foot and record the length.

Gross Motor Grip Ruler

Measuring Wheel

Crayola Audio Ruler

Kid's Ruler

LOUISIANA CONNECTORS **Essential Elements Cards**
MATH-Measurement

Concrete Understandings:

- Use connecting objects, e.g., cubes, to measure attributes of distance, length, and height.
- Use a scale to compare the weight of two objects.

Representation:

- Select representation of more and less, short and long, heavy and light; tall and short.
- Apply understanding that if object 1 is longer/heavier than object 2 and object 2 is longer/heavier than object 3, then object 1 must be longer than object 3.

Suggested Instructional Strategies:

- Model-Lead-Test (“Watch me...do together...you try”)
- Least-to-Most prompts (e.g., “Start by putting the shortest item in place like this…”)

Low Incidence Supports

Activity:

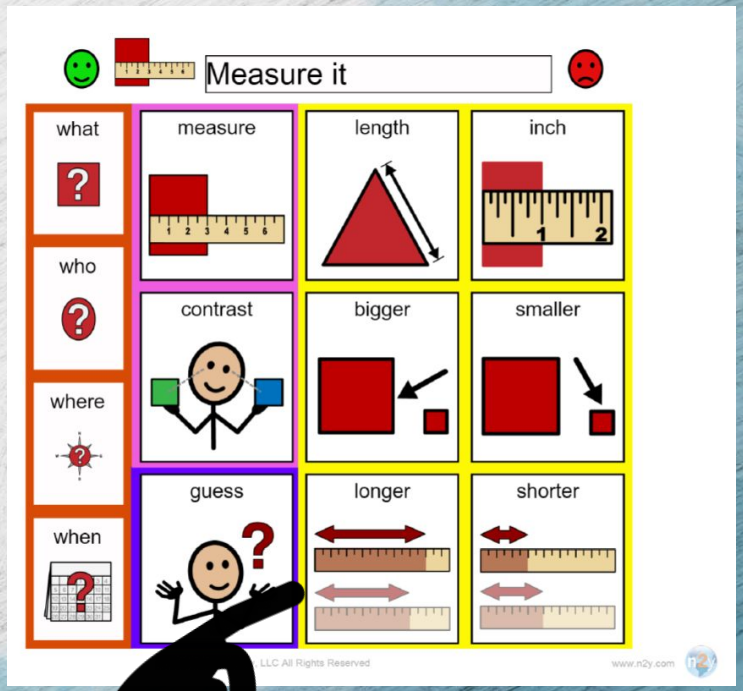
Have students compare the length of items and identify as long or short.

Question?
"Is your object long or short?"

Single Message Communicator

Talking Measuring Tape

Communication Board



Louisiana Student Standards for Mathematics

Operations and Algebraic Thinking

4.OA.A: Use the four operations with whole numbers to solve problems.

-3.OA.A: (*4th Grade Remediation Guide*) Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.

🔗 **LC.4.OA.A.1** Use objects to model multiplication and division situations involving up to 5 groups with up to 5 objects in each group and interpret the results.

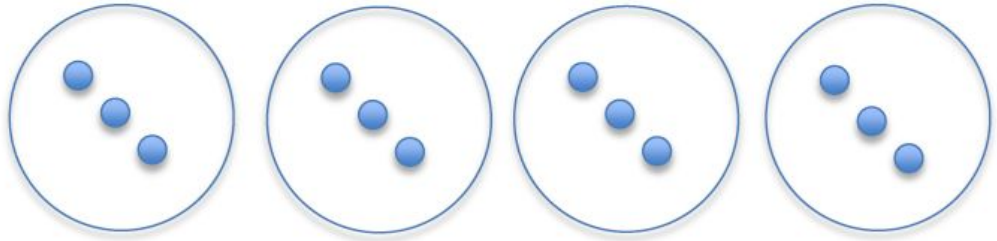
🔗(LC=Louisiana Connectors)

LESSON: Operations

Diagnostic Assessment: Grade 4
Eureka Module 1, Topic A

Part A: 3.OA.A.1:

1. Write a number sentence that could be used to represent the total number of dots in the model below.



2. Draw a model to represent 3×5.

3. Interpret and compute the product 10×10. Use a model to support your answer.

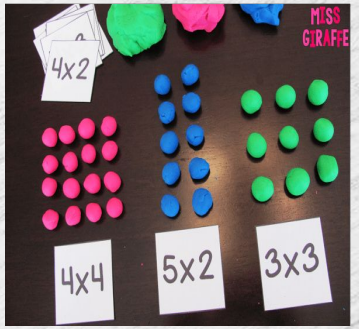
High Incidence Supports

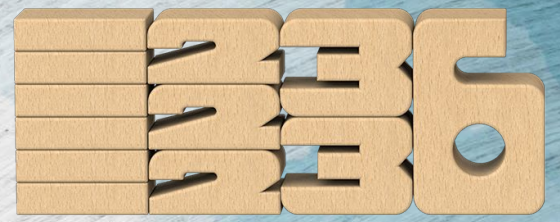
Activity:

Write a number sentence from a model represented in groups.

Interpret and compute the product.

	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100





0	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

LOUISIANA CONNECTORS **Essential Elements Cards**
MATH-Patterns, Relations, and Fractions

Concrete Understandings:

- Create an array (e.g., show me 2 groups/rows of 3; or 2 x 3).
- Use calculator and/or manipulatives to add and subtract within 50.

Representation:

- Use an array to represent a multiplication or division problem.
- Select a numeral to place under each representation in the modeled equation.
- Select a pictorial representation of an array that matches the multiplication or division problem.
- Understand the following concepts, vocabulary and symbols: =, X, ÷, groups, objects, set, equal groups, combination, comparison, multiplication, division, array, row, column, equation.

Suggested Instructional Strategies:

- Multiple Exemplar Training
  - Equal sets: “This is a set. This is an equal set. This is an equal set. This is not an equal set. Show me an equal set.”
- Teach multiple ways of describing multiplication (e.g., 2 x 2 = 4; 2 times 2 = 4; a 2 by 2 array is 4).
- Task Analysis for solving simple multiplication and division problems using arrays:
  - When multiplying, teach that “X” means multiply and to read the multiplication symbol as “rows of.” For example, read the problem 2 x 3 as “two rows of three.”
    - Teach that the first number indicates the number of rows and the second number indicates the number of shapes/objects in each row.
    - Using grid paper or other graphic organizer, draw the first row of the array (e.g., one row of three).

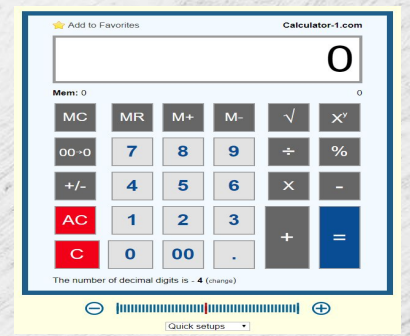
Low Incidence Supports

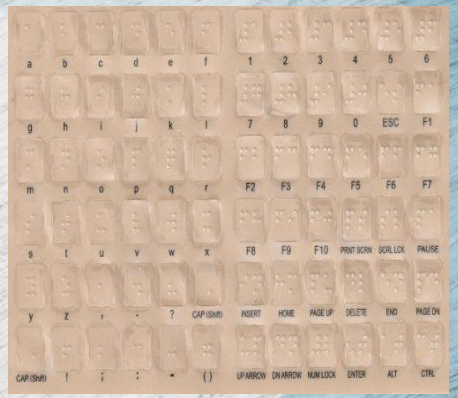
Activity:

Model multiplication by using concrete objects.

Emily is putting pens into boxes.
There are 5 boxes. There are 4 pens in each box.

Make squares to represent the boxes.
Make Xs to represent the pens.
How many pens altogether?





Louisiana Student Standards for Mathematics

Geometry

6.G.A.4: Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems**.**

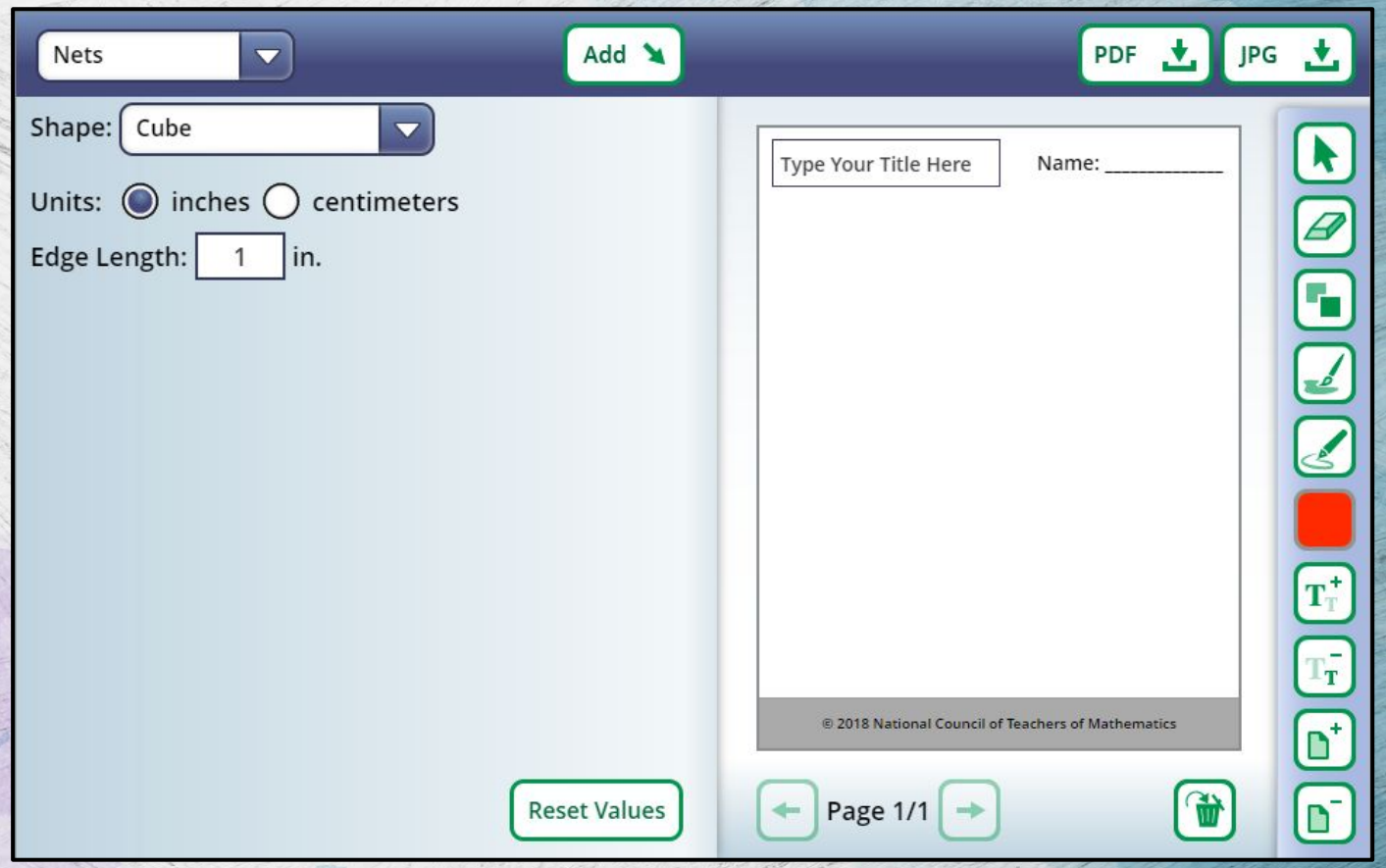
- **LC.6.G.A.4** Find the surface area of three dimensional figures using nets of rectangles or triangles.

(LC=Louisiana Connectors)

LESSON: Geometry

Students can create nets of 3D figures with specified dimensions using the dynamic Paper Tool on NCTM's Illuminations

https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Dynamic-Paper/



Louisiana Student Standards: Companion Document for Teachers

Grade 6 Math

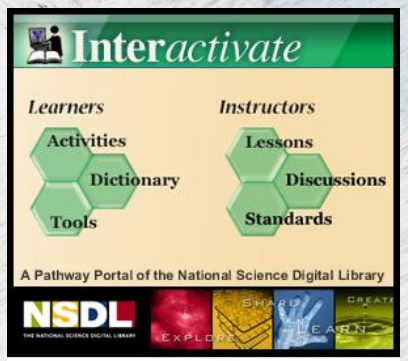
https://www.louisianabelieves.com/docs/default-source/teacher-toolbox-resources/geometry---teachers-companion-document-pdf.pdf?sfvrsn=15

High Incidence Supports

Activity:

Unfold three-dimensional objects into nets.

Understand the following concepts and vocabulary: base, height, slant, surface area, prism, net, and face.



GeoGebra

LOUISIANA CONNECTORS **Essential Elements Cards**
MATH-Geometry

Concrete Understandings:

- Demonstrate an understanding of the concept of the surface area of a rectangular prism.
- Unfold three-dimensional objects into nets.

Representation:

- Use formulas for surface area.
- Understand symbols from formula.
- Understand 2- and 3-D dimensionality (2-D is space covered, 3-D is the space within).
- Understand the following concepts and vocabulary: base, height, slant, surface area, prism, net, face.

Suggested Instructional Strategies:

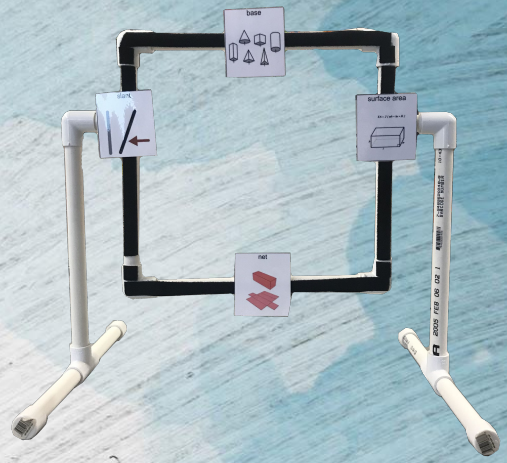
- Task analysis
  - Identify a face in the figure.
  - Find the area of each face in the figure.
    - measure the length
    - put a number in formula
    - measure height
    - put number in formula
    - use calculator to compute area
  - Add are of all faces together to find the surface area.
- Explicit use of the formulas.

Low Incidence Supports

Activity:

Unfold three-dimensional objects into nets.

Understand the following concepts and vocabulary: base, height, slant, surface area, prism, net, and face.



Louisiana Student Standards for Mathematics

Algebra I

A1: A-CED.A.1: Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic, and exponential functions.

-7.EE.B.4: (Algebra 1 Remediation Guide) Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities

-8.EE.C.7: (Algebra 1 Remediation Guide) Solve linear equations in one variable.

🔗**LC. A1:A-CED.A.1** Translate a real-world problem into a one variable linear equation.

🔗(LC=Louisiana Connectors)

LESSON: Algebra I

Students can create equations to solve real world and mathematical problems by comparing the values of two different functions.

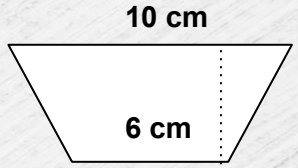
Louisiana Student Standards: Companion Document for Teachers

Algebra

EXAMPLES:

- To be considered a “fuel efficient” vehicle, a car must get more than 30 miles per gallon. consider a test run of 200 miles. How many gallons of fuel can a car use and be considered “fuel efficient”?

- Given that the following trapezoid has an area of $54cm^2$, set up an equation to find the length of the base, and solve the equation.



- Lava coming from the eruption of a volcano follows a parabolic path. The height *h* in feet of lava *t* seconds after it is ejected from the volcano is given by $h(t) = -t^2 + 16t + 936$. After how many seconds does the lava reach its maximum height of 1000 feet?

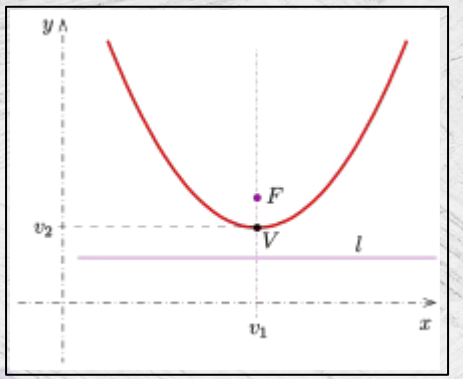
- A rental agreement locks the monthly rent of an apartment to a constant value for one year. The average rate to rent an apartment is $750 per month and increases at an inflation rate of 8% per year. If inflation continues at the current rate, on which year will the rent be at least $1000 per month?

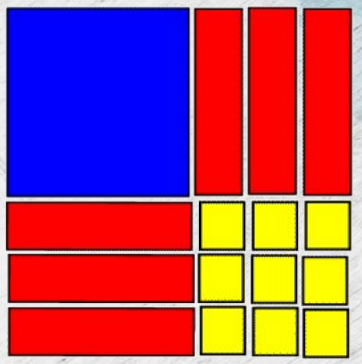
https://www.louisianabelieves.com/docs/default-source/teacher-toolbox-resources/algebra-i---teachers-companion-document-pdf.pdf?sfvrsn=22

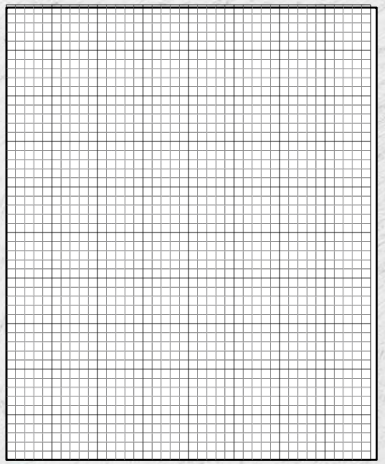
High Incidence Supports

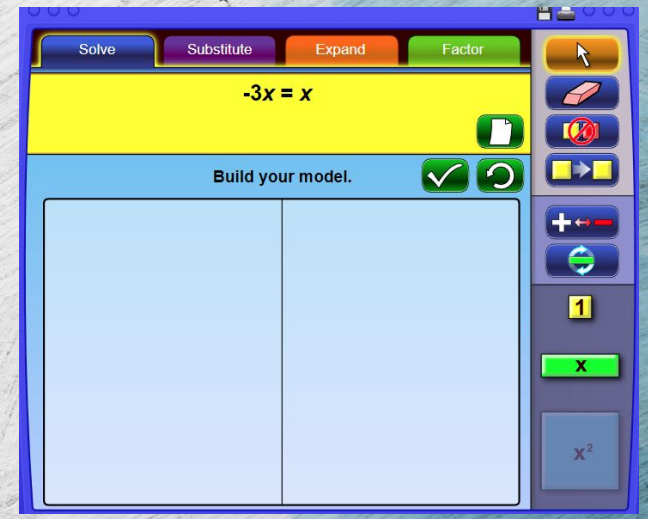
Activity:

Create equations that describe a real-world problem.









LOUISIANA CONNECTORS **Essential Elements Cards**
MATH-Algebra I

Concrete Understandings:

- Match an equation with one variable to a real-world context.

Representation:

- Create a pictorial array of a simple equation to translate wording.
- Know the following vocabulary and symbols: +, -, X, ÷, =, linear, variable.

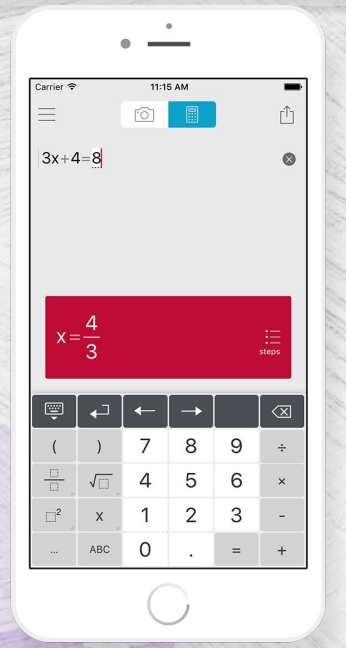
Suggested Instructional Strategies:

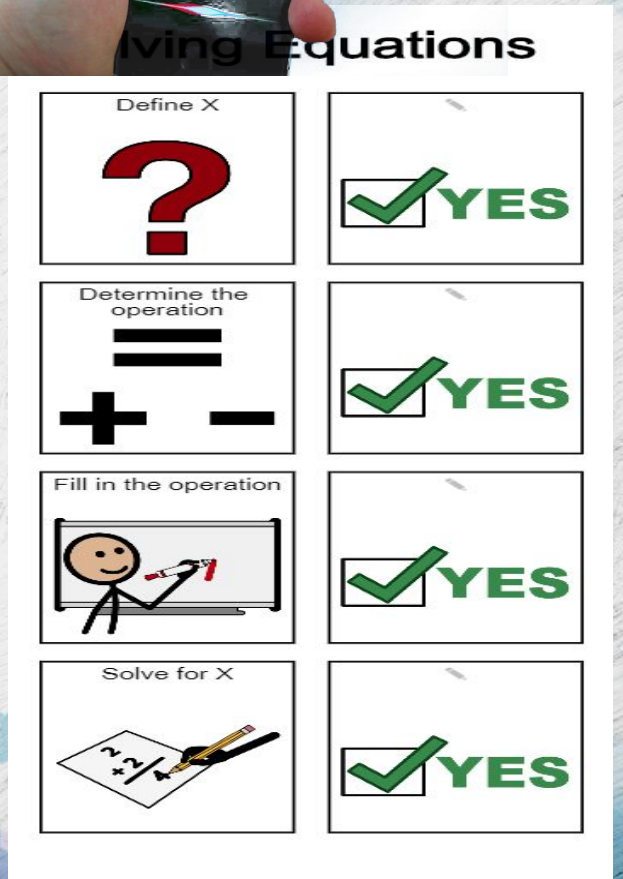
- Task analysis
  - Present the story problem based on a real-world, relevant context and provide a template for recording facts/operation to solve the real-world problems.
  - Highlight key information in the problem; strikethrough irrelevant information.
  - Identify what question is being asked (define x).
  - Identify the facts.
  - Fill in the order presented in the story problem on the template.
  - Determine the operations(s) (+, -, X, ÷).
  - Identify what operation should be completed first.
  - Fill in the operation.
  - State the equation.
  - Solve for x.
- Answer the problem statement.

Low Incidence Supports

Activity:

Create equations that describe a real-world problem.





Session Materials

Questions ?

For more information visit:

www.laticenters.org