Make sense of problems and persevere in solving them

When presented with a problem, I can make a plan, carry out my plan, and evaluate its success.

**BEFORE...**

**EXPLAIN** the problem to myself.
- Have I solved a problem like this before?

**ORGANIZE** information...
- What is the question I need to answer?
- What is given?
- What is not given?
- What are the relationships between known and unknown quantities?
- What tools will I use?
- What prior knowledge do I have to help me?

**DURING...**

**PERSEVERE**

**MONITOR** my work

**CHANGE** my plan if it isn’t working out

**ASK** myself, “Does this make sense?”

**AFTER...**

**CHECK**
- Is my answer correct?
- How do my representations connect to my algorithms?

**EVALUATE**
- What worked?
- What didn’t work?
- What other strategies were used?
- How was my solution similar to or different from my classmates’?
## Reason abstractly and quantitatively

**I can use reasoning habits to help me contextualize and decontextualize problems.**

### CONTEXTUALIZE

I can take numbers and put them in a real-world context.

For example, if given:

\[3 \times 2.5 = 7.5\]

I can create a context:

*I walked 2.5 miles per day for 3 days. I walked a total of 7.5 miles.*

### DECONTEXTUALIZE

I can take numbers out of context and work mathematically with them.

For example, if given:

‘I walked 2.5 miles per day for 3 days. How far did I walk?’,

I can write and solve:

\[3 \times 2.5 = 7.5\]

**Reasoning Habits include**

1) creating an understandable representation of the problem solved,
2) considering the units involved,
3) attending to the meaning of quantities, and
4) using properties to help solve problems.

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Jordan School District 2011, Grade 6
Construct viable arguments and critique the reasoning of others

I can make conjectures and critique the mathematical thinking of others.

I can construct, justify, and communicate arguments by...

- considering context
- using examples and non-examples
- using objects, drawings, diagrams and actions

I can critique the reasoning of others by...

- listening
- comparing arguments
- identifying flawed logic
- asking questions to clarify or improve arguments
Model with mathematics

**I can recognize math in everyday life and use math I know to solve everyday problems.**

**I can...**

- make assumptions and estimate to make complex problems easier
- identify important quantities and use tools to show their relationships
- evaluate my answer and make changes if needed
Use appropriate tools strategically

I know when to use certain tools to help me explore and deepen my math understanding.

I have a math toolbox.

◆ I know **HOW** to use math tools.
◆ I know **WHEN** to use math tools.
◆ I can reason: “Did the tool I used give me an answer that makes sense?”

V = b x h

a x b = b x a
Attend to precision

I can use precision when solving problems and communicating my ideas.

**Problem Solving**

- I can calculate *accurately*.
- I can calculate *efficiently*.
- My answer matches what the problem asked me to do – estimate or find an exact answer.

**Communicating**

- I can SPEAK, READ, WRITE, and LISTEN mathematically.
- I can correctly use...
  - math symbols
  - math vocabulary
  - units of measure
Look for and make use of structure

I can see and understand how numbers and spaces are organized and put together as parts and wholes.

Numbers

For Example:
- Base 10 structure
- operations and properties
- terms, coefficients, exponents

Spaces

For Example:
- dimension
- location
- attributes
- transformation

10  +  3

10  100  30

+  5  50  15

10 + 3  x  (10 + 5)

100 + 30 + 50 + 15

195
Look for and express regularity in repeated reasoning

I can notice when calculations are repeated. Then, I can find more efficient methods and short cuts.

For example: \(25 \div 11\)

\[
\begin{array}{c|c|c|c|c|c|c}
\hline
11 & 25.0000 \\
\hline
-22 & & & & & \\
\hline
30 & & & & & \\
-22 & & & & & \\
\hline
80 & & & & & \\
-77 & & & & & \\
\hline
30 & & & & & \\
-22 & & & & & \\
\hline
80 & & & & & \\
-77 & & & & & \\
\hline
30 & & & & & \\
\hline
\end{array}
\]

I am repeating this calculation. The quotient is a repeating decimal.