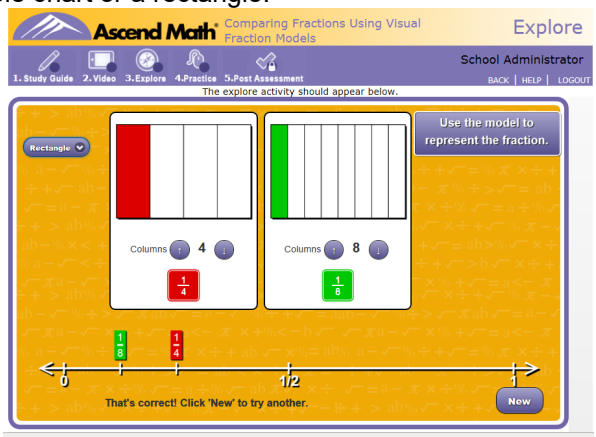
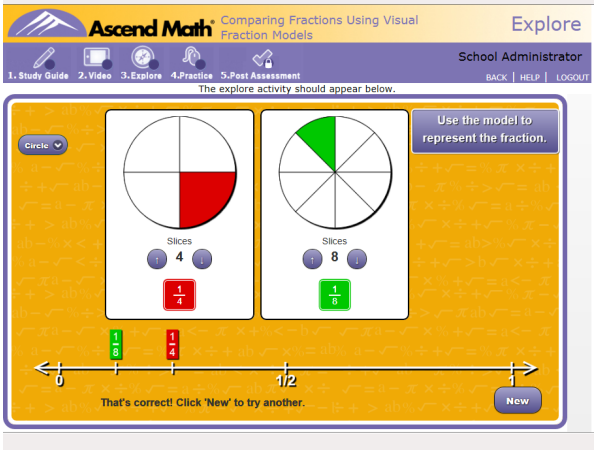
Contents

1. Make sense of problems and persevere in solving them.

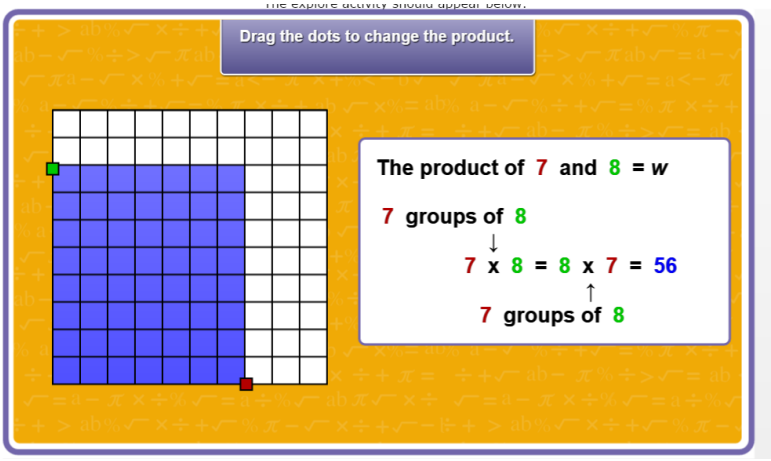
   Ascend Math teaches flexible mathematical thinking by encouraging development of multiple tactics for similar problems. Students are encouraged to make sense of and understand the concept they are working on. See the example below – the numerical representation is compared to an area model which in turn is compared to a number line display. Students may explore the concept using either a pie chart or a rectangle.

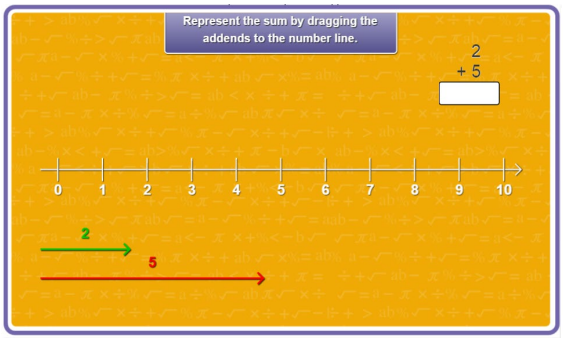


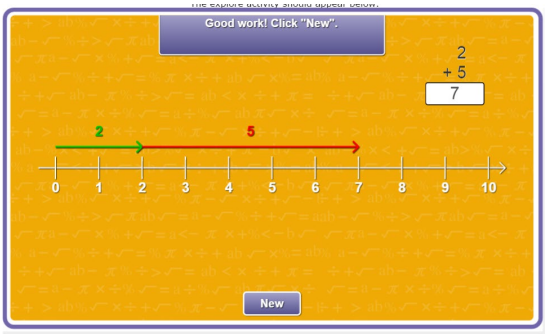


2. Reason abstractly and quantitatively.

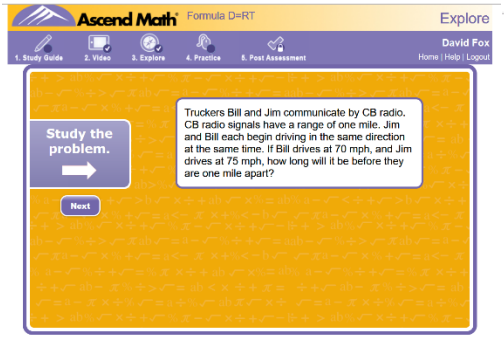
Mathematical reasoning requires attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects. Ascend Math integrates visual approaches to acquisition of math skills. Please see examples below!

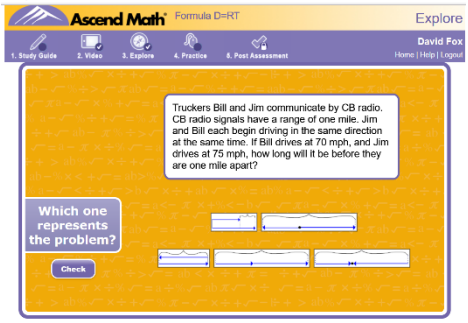






Students are first asked to visualize the problem (abstract):

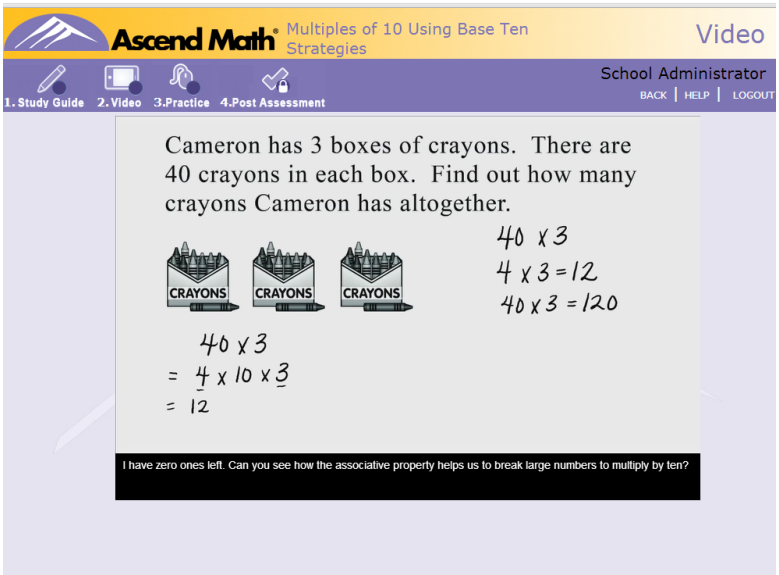




Set up the equations and then solve for the answer (quantitative).

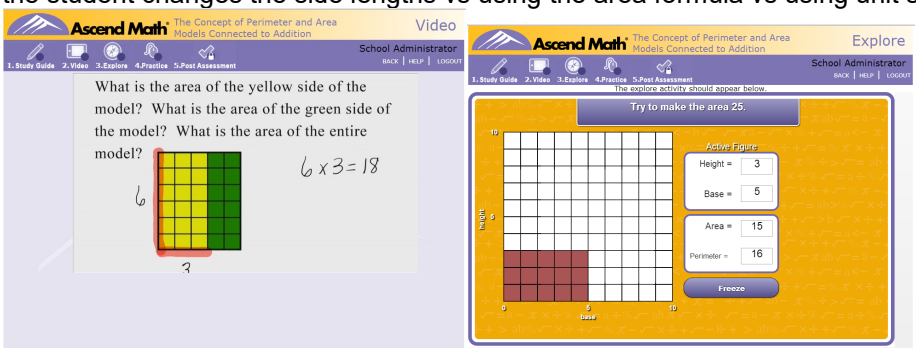
3. Construct viable arguments and critique the reasoning of others.

By offering a multi modal approach to instruction, using video, interactive explorations, practice problem video solutions, as well as study guides Ascend Math teaches a multitude of problem solving strategies for learners of varying aptitudes and affinities. Ascend provides real world applications throughout, such as tip-calculation, interest, wages, taxes, and task rates.

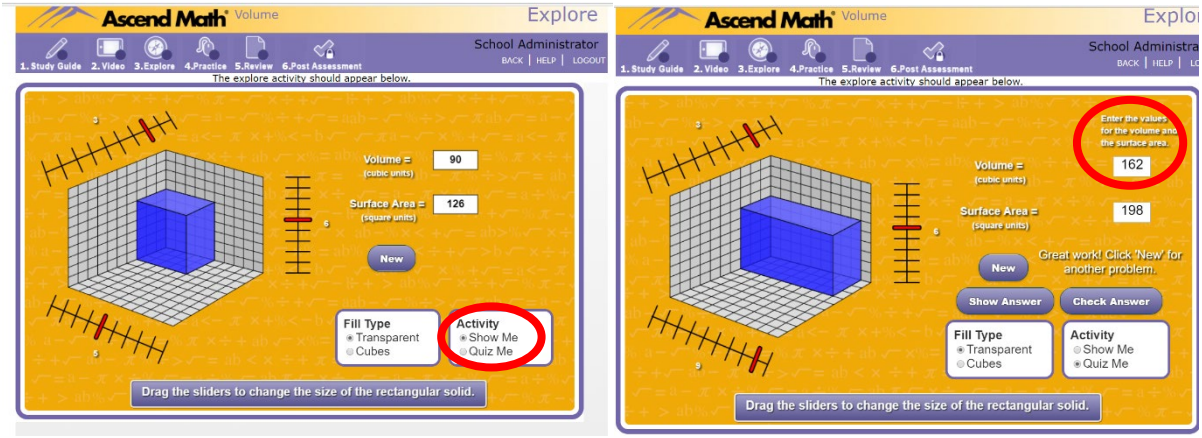


4. Model with mathematics.

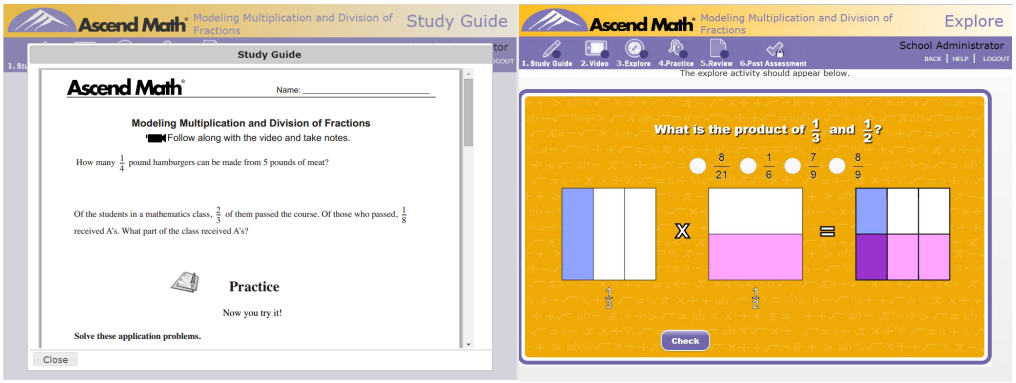
Ascend Math provides opportunities to discover formulas and processes discussed in the instructional video portion by connecting these to models.
E.g. solving an area-of-a-square problem with an interactive exploration by seeing the area and how it changes as the student changes the side lengths vs using the area formula vs using unit squares.



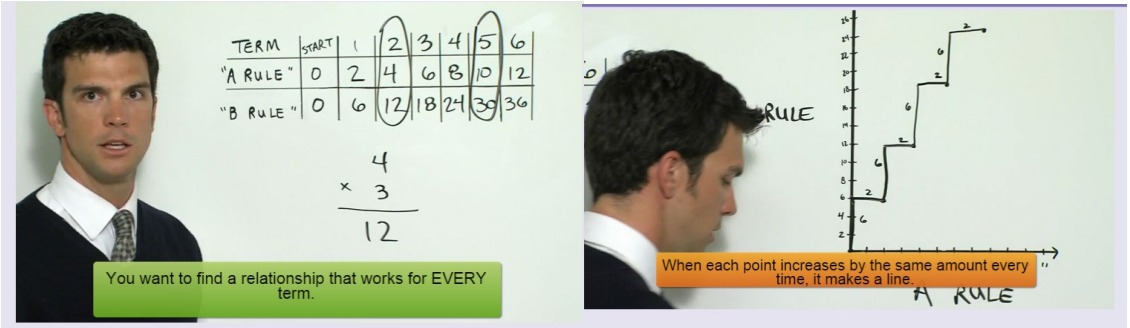
E.g. Visualizing the volume formula and watch the end result change as side length are manipulated, not just plugging answer into a formula.



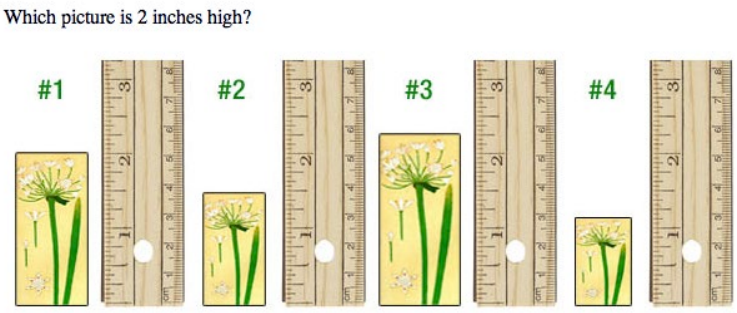
Ascend Math connects visual and symbolic learning throughout the entire study plan at all levels. See an example below. Fraction multiplication is taught not only by symbolic calculation, but also using visual representation.



5. Use appropriate tools strategically.
   Ascend encourages use of tools, such as tables, models, steps, etc. to solve. Students respond differently to varying approaches.
   See below for an example of a video. Patterns and relationships are discovered using different tools during the instruction portion.

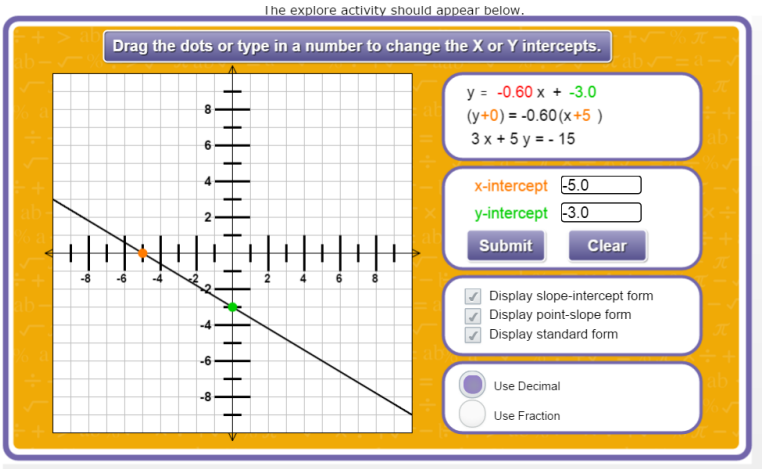


6. Attend to precision.
   Concrete, representational/pictorial, and abstract: Tool use is taught in many applicable areas, while encouraging precision as well as real life estimation.



7. Look for and make use of structure.

Structure is present throughout math. Ascend utilizes this to teach students approaches to problem solving. As an example see below: The connection between the graph and the equation of a function are emphasized by color coding the parts involved, such as orange for the x-intercept.



8. Look for and express regularity in repeated reasoning.

Looking for repeated reasoning in mathematics allows for deeper understanding and easier calculations. Ascend shows instances of repeated reasoning to students, so they can make use of these.