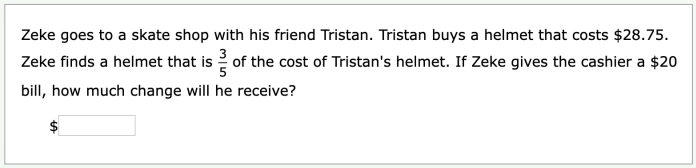
IXL and the Standards for Mathematical Practice

IXL Math helps students build the strategies and confidence needed long-term to solve complex problems. IXL's engaging, adaptive questions provide the right level of rigor to help students develop deep conceptual understanding and guide them on their path to math fluency.

Explore a few examples of how IXL Math directly addresses the eight Standards for Mathematical Practices in the middle school grade levels.

STANDARDS FOR MATHEMATICAL PRACTICE	HOW IXL ADDRESSES THE STANDARDS FOR MATHEMATICAL PRACTICE	EXAMPLES OF MIDDLE SCHOOL MATH SKILLS
1. Make sense of problems and persevere in solving them.	Students think critically about information in real-world and mathematical problems, identify and understand the questions being asked, and create and execute efficient strategies to find solutions.	**IXL skill: Multi-step word problems with positive rational numbers** (Skill ID: JVU) Students are challenged to understand, strategize for, and solve a wide variety of real-world, multi-step problems. The problems include positive decimals and fractions, so students must also tackle any involved calculations, persevering and adjusting their plan as needed.  Additional examples: • Multi-step problems with percents (Skill ID: ZHX) • Solve a system of equations using any method: word problems (Skill ID: VHE)
2. Reason abstractly and quantitatively.	Students switch smoothly between concrete real-world situations and abstract mathematical representations of them. They use their representations to reason abstractly without losing sight of the meaning	**IXL skill: Solve two-step equations: word problems** (Skill ID: D2Y) Students choose an equation to represent the relationship between the known and unknown quantities in a real-world situation, then reason abstractly to solve for the unknown quantity and then express the solution in the context of the situation.

of the quantities involved and then communicate their solutions in the context of the real-word situation.

Bert made 3 batches of his uncle's signature spicy wing sauce for a barbecue last weekend. He didn't want the sauce to be too spicy, so he tweaked the recipe, reducing the amount of hot sauce he put in each batch by 2 ounces. Bert used 24 ounces of hot sauce in all to make the wing sauce.

Which equation can you use to find u, the amount of hot sauce Bert's uncle usually puts in each batch of spicy wing sauce?

$3(u - 2) = 24$ | $2(u - 3) = 24$

$2u - 3 = 24$ | $3u - 2 = 24$

How much hot sauce does Bert's uncle usually put in each batch of spicy wing sauce?

Write your answer as a whole number or a simplified fraction.

____ ounces

Additional examples:

- Solve a system of equations by graphing: word problems (Skill ID: W9J)
- Which simulation represents the situation? (Skill ID: D87)

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

Students construct viable arguments by justifying their thinking. They evaluate the arguments of others and, when appropriate, correct invalid reasoning.

IXL skill: Identify mistakes involving the order of operations (Skill ID: V46)

Students evaluate someone else's work and not only determine where invalid reasoning occurred, but also explain why that step was invalid and how to correct it.

Justine tried to evaluate an expression. Here is her work:

$10 - 4 + 2(4)^2$

$= 10 - 4 + 8^2$ *Step 1*

$= 10 - 4 + 64$ *Step 2*

$= 6 + 64$ *Step 3*

$= 70$ *Step 4*

Is Justine's work correct?

No, Justine made a mistake going from the given expression to Step 1. Justine should have squared 4 before multiplying. The order of operations says to evaluate exponents before you multiply.

No, Justine made a mistake going from Step 2 to Step 3. Justine should have added before she subtracted. The order of operations says to add before you subtract.

Yes, Justine's work is correct.

Additional examples:

- Write equivalent expressions using properties (Skill ID: R8H)
- Solve multi-step equations: complete the solution (Skill ID: PGH)



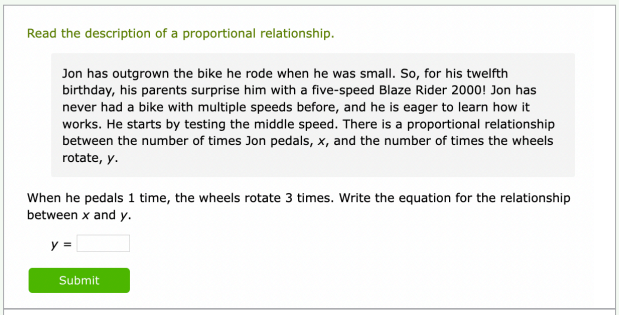
4. Model with mathematics.

Students apply math concepts to model and solve a variety of real-world problems. They use mathematical models, such as diagrams, equations, and graphs, to represent and analyze real-world situations and draw conclusions.

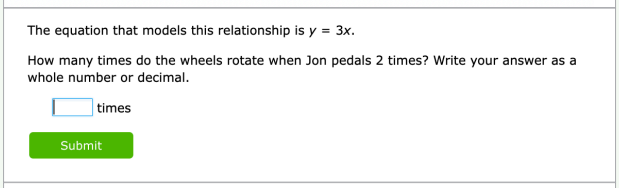
IXL skill: Write and solve equations for proportional relationships (Skill ID: VKK)

Students build and apply models for proportional relationships. Each question is presented in three parts. In part one, students read a description of a proportional relationship and model it with an equation. In parts two and three, students use their model from part one to answer real-world questions.

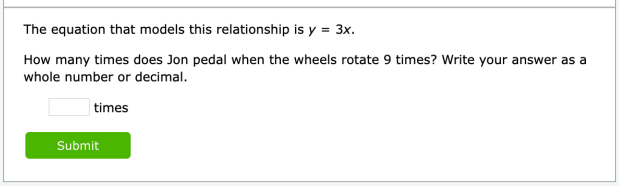
step 1



step 2



step 3



Additional examples:

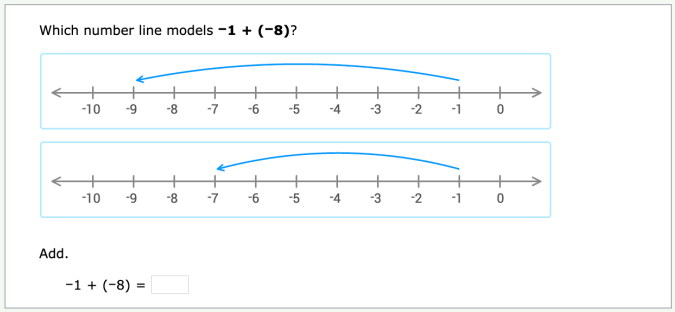
- Solve percent problems using strip models (Skill ID: MEA)
- One-step inequalities: word problems (Skill ID: 6HD)

5. Use appropriate tools strategically.

Students use mathematical tools, such as number lines, tables, and algebra tiles, to strategically solve problems. Students learn how to effectively use these tools, develop their sense for when each tool may be helpful, and apply their knowledge when solving similar problems with less guidance by choosing appropriate tools.

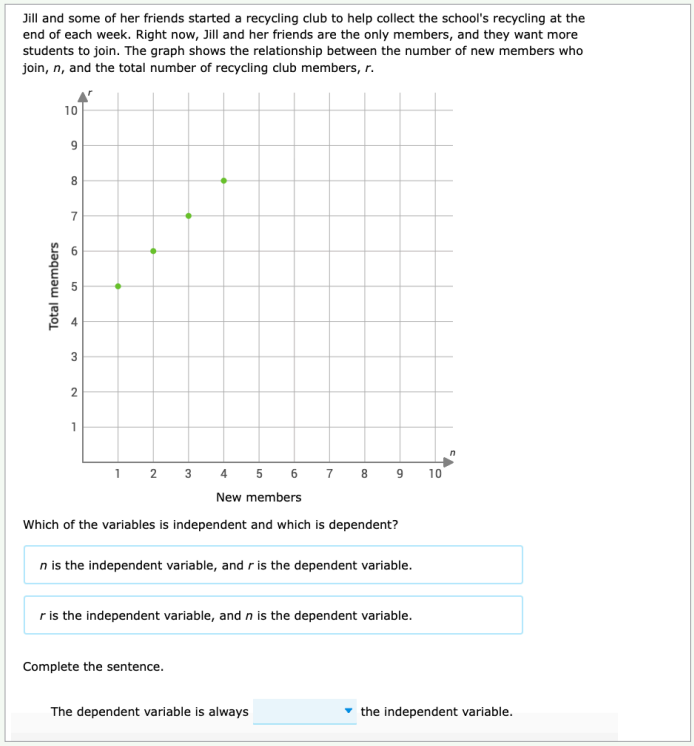
IXL skill: Add integers using number lines (Skill ID: A63)

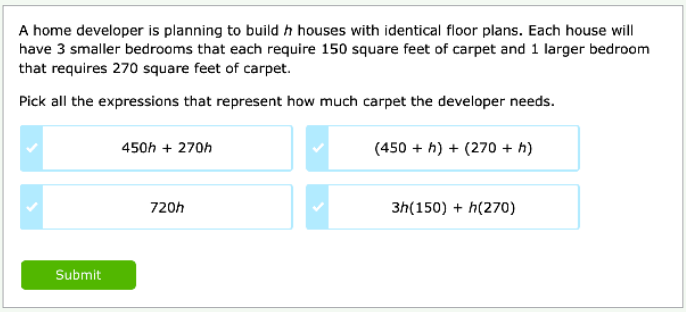
Students learn how to use a familiar tool, number lines, to make sense of a new and potentially tricky concept, adding integers.



Additional examples:

- Complete a table and graph a linear function (Skill ID: DC2)
- Model and solve equations using algebra tiles (Skill ID: EGK)

6. Attend to precision.	Students use precision when communicating about math, creating representations, and solving problems. They use appropriate units of measure, apply and communicate using proper definitions and clearly defined variables, and express solutions precisely.	**IXL skill: Identify independent and dependent variables in tables and graphs** (Skill ID: YFW) Students first examine the axes of a graph to identify the independent and dependent variables. Students then examine the relationship between the variables in the graph and describe it using precise mathematical language.  Additional examples: • Unit prices with unit conversions (Skill ID: KJ8) • Describe distributions in line plots (Skill ID: RZL)
7. Look for and make use of structure.	Students recognize structure when analyzing mathematical expressions, graphs, and diagrams. Students then apply those structures to simplify and solve problems.	**IXL skill: Identify equivalent linear expressions: word problems** (Skill ID: KWH) Students are presented with a real-world situation and four linear expressions. Students are given a specific quantity in the situation and asked to identify all the equivalent expressions that represent it. In order to make sense of and efficiently solve these problems, students must understand the structure of each linear expression and how it relates to the situation, as well as relevant algebraic properties, such as the distributive property.



Additional examples:

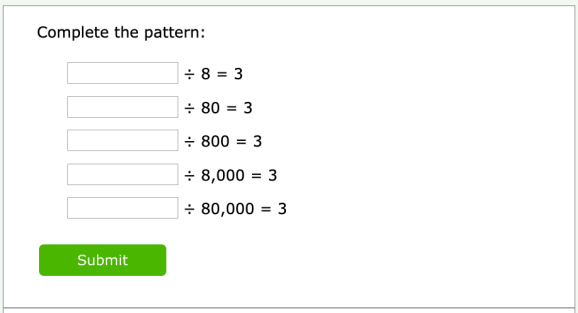
- Understanding area of a parallelogram (Skill ID: QMU)
- Create equations with no solutions or infinitely many solutions (Skill ID: 7TY)

8. Look for and express regularity in repeated reasoning.

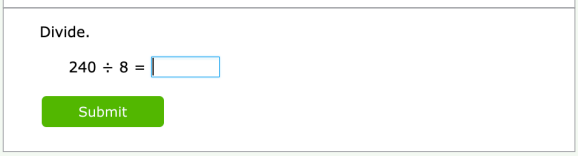
Students recognize mathematical patterns. Students then use those patterns to make generalizations, find shortcuts, and solve problems efficiently.

IXL skill: Division patterns with zeroes (Skill ID: CEZ)
Students answer scaffolded questions to uncover patterns involving dividing numbers that end in zeroes. Later in the skill, the scaffold is removed and students are ready to apply the pattern they've recognized to simplify what otherwise could be arduous division problems. Understanding this pattern helps students divide fluently and efficiently.

step 1

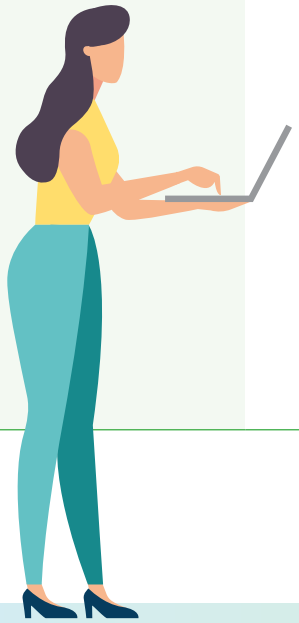


step 2



Additional examples:

- Write an equation from a graph using a table (Skill ID: BCM)
- Find the number of solutions to a system of equations (Skill ID: UYM)



Reach out to learn more about how schools across the country are partnering with IXL to engage students and fill academic gaps!

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