

## Grade 3: Number Stories

Number Stories is a lesson structure in the Success Academy conceptual math curriculum. It is based on the [Cognitively Guided Instruction](#) model. Number Stories teaches students to unpack and solve complex, unfamiliar problems to develop mathematical thinking and problem-solving skills, explain their thinking and construct mathematical arguments, build an understanding of grade-level conjectures and concepts, and apply concepts, strategies, and models learned in math and mini-lessons to novel contexts.

In Grade 3, students work to solve two types of problems during Number Stories. The Number Stories block happens 2-3 times per week for approximately 40 minutes

- **Problems:** Students work to solve interesting math problems, which become increasingly difficult as the year progresses.
- **Challenge Problems:** These complex problems give students additional opportunities to practice and reinforce mathematical thinking.

### Problems

**1** Christian has 239 pennies. Simon has 96 more pennies than Christian. How many pennies does Simon have?

- Type: CQU
- Answer: 335 pennies
- Number Sentence to Match the Story:  $239 + 96 = n$

**2** The art room had a total of 111 coloring supplies. There were 63 pencils and the rest were crayons. The art room had 6 boxes of crayons. If each box of crayons had the same amount, how many crayons were in each box?

- Type: PPW-PU, PD
- Answer: 8 crayons
- Equation to Match the Story:  $63 + (6 \times n) = 111$ ; Scholars are NOT expected to write this equation.

**3** Miriam had 181 baseball cards. She gave 109 baseball cards to her sister. How many more baseball cards does she need to have 136 cards?

- Type: SRU, JCU
- Answer: 64 baseball cards
- Equation to Match the Story:  $181 - 109 + n = 136$

**4** Bianca has 108 pieces of candy to put into bags for her birthday party. She wants to put 9 pieces of candy in each bag. How many bags of candy can she make?

- Type: MD
- Answer: 12 bags

- Equation to Match the Story:  $nx9=108$ ; Scholars are NOT expected to write this equation.

**5** Brett walked 9 dogs and earned \$8 for each dog. Lindsey groomed 4 cats and earned \$9 for each cat. How much more did Brett earn than Lindsey?

- Type: M, CDU
- Answer: \$36 more
- Equation to Match the Story:  $(9 \times 8) - (4 \times 9) = n$ ; Scholars are NOT expected to write this equation.
- Scholars now have the knowledge of "groups of" from the Groceries, Stamps, and Measuring Strips unit. Push for a discussion around the associative property, specifically around efficient doubling/halving strategies and the commutative property.

**6** There are 4 large boxes, and inside each large box there are 3 medium-sized boxes. Inside each of these medium boxes there are 2 small boxes. How many boxes, including all sizes, are there?

- Type: N/A
- Answer: 40 boxes
- Equation to Match the Story: Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.
- This problem might be difficult for scholars to visualize! This is a good opportunity to highlight the use of a model and how the model connects to the numbers in the problem.

**7** There are 4 blueberry pies for dessert. If each child eats one fourth of a pie, how many children can eat pie?

- Type: MD-MG
- Answer: 16 children
- Equation to Match the Story:  $nx\frac{1}{4}=4$ ; Scholars are NOT expected to write this equation.
- Teachers can discuss how the repeated addition of fractions (in this case fourths) is related to multiplication; fractions can be multiplied just like whole numbers!

**8** There are 6 children that each want to eat half of a banana. How many bananas will the children eat in all? There are 8 children that each want to eat half of a banana. How many bananas will the children eat in all?

- Type: M-MG
- Answer: 3 bananas, 4 bananas
- Equation to Match the Story:  $6x\frac{1}{2}=n$ ,  $8x\frac{1}{2}=n$ ; Scholars are NOT expected to write this equation.

**9** Professor Tarbell was taking note of how quickly cells divide in his science lab. On May 1st, there were 2 cells. On May 2nd, there were 4 cells. On May 3rd, there were 8 cells. If the cells keep growing in number at the same rate, what will be the date when there are 1,024 cells?

- Type: N/A
- Answer: May 10th
- Equation to Match the Story: Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.
- Highlight scholars who have organized their thinking in the form of a table or chart share why they thought this format was helpful when solving.

**10** A farmer planted a pumpkin vine next to a watermelon vine. The pumpkin vine grew 8 inches per week for 9 weeks. During that time, the watermelon vine grew twice as fast as the

pumpkin vine. If the watermelon vine is now 10 inches away from the fence, how far away from the fence is the pumpkin vine?

- Type: Multi-step
- Answer: 82 inches
- Equation to Match the Story:  $(2 \times 9 \times 8 + 10) - (9 \times 8) = n$ ; Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**11** Ms. Suarez had sentence strips that were all equal in length. She gave 10 strips to Farrah, 5 strips to Lyzzah, and 20 strips to Chelsea. The girls put their own sentence strips end-to-end to each make a long line. If Farrah's line was 60 inches total, how long was Lyzzah's line? How long was Chelsea's line?

- Type: Multi-step
- Answer: 30 inches; 120 inches
- Equation to Match the Story:  $(60 / 10) \times 5 = L$ ;  $(60 / 10) \times 20 = C$ ; Scholars are not formally introduced to the division symbol until Unit 4 and are therefore not expected to write an equation. Instead, focus on scholars approach to the problem.

**12** A school is going on a field trip to the Bronx Zoo and rented 3 buses. Each bus has the same number of students on it. At the zoo, 25 students decided to visit the butterfly exhibit while the other 35 students went to the reptile house. How many students were on each bus?

- Type: Multi-step
- Answer: 20 students
- Equation to Match the Story:  $(25+35)/3=n$ ; Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**13** There are 296 Smencils and 654 spinning tops in a treasure chest. If each child takes 10 prizes, how many children can take prizes?

- Type: PPW-WU, D
- Answer: 95 children
- Equation to Match the Story:  $(296+654)/10=n$ ; Scholars are NOT expected to write this equation.

**14** Joe has 10 cartons with 12 eggs in each carton. He has 84 more eggs than Anne. Anne has 3 fewer eggs than Paul. How many eggs does Paul have?

- Type: M, CQU, CRU
- Answer: 39 eggs
- Equation to Match the Story:  $(10 \times 12) - 84 + 3 = n$

**15** Andrea is making cookies for her school's bake sale. For every tray of cookies she needs 4 cups of sugar. Each bag of sugar contains 8 cups. If she wants to make 6 trays of cookies, how many bags of sugar will she need to buy?

- Type: Multi-step
- Answer: 3 bags
- Equation to Match the Story:  $(6 \times 4) / 8 = n$ ; Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**16** Emily wants to hang a bird feeder from the tree outside her house. The height of the branch on the tree is five times as tall as the fence in her yard. She knows her height is half the height of the fence. If Emily is 3 feet tall, is her 20-foot ladder long enough to reach the branch?

- Type: Multi-step
- Answer: No. Scholar work must prove why their answer is correct.
- Equation to Match the Story:  $5x(2x3) > 20$ ; Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**17** Ms. Lee bought cupcakes for her school Halloween party. She ordered 5 boxes of cupcakes. Each box had 6 containers of cupcakes. Each container had 8 cupcakes in it. If there are 12 tables at the party and 10 people at each table, will she have enough cupcakes for each person? Show your work and explain why or why not.

- Type: Multi-step
- Answer: Scholar answers and work should reflect the understanding that Ms. Lee will have enough cupcakes for each person.
- Example Scholar Response: Yes, she will have double the amount of cupcakes needed. There are 120 people attending the party but she bought 240 cupcakes.
- Equation to Match the Story: Scholars are not expected to write an equation. Instead, focus on scholars' approach to the problem.

**18** Coach G is hosting a pizza party for his basketball team. He estimates that each guest attending the party will eat one fourth of a pizza pie. Every player on the 8 person team is bringing a friend to the party. How can he figure out how much pizza his guests will eat altogether? Show your work and explain your reasoning.

- Type: Multi-step
- Answer: Scholars may approach this differently and their answers will reflect how they choose to solve.
- Example Scholar Response: First Coach G will need to calculate the amount of guests that are attending the party. He knows that each of his 8 players are bringing a friend to the party so he can double 8 to figure out the total number of 16 guests. Then, since he also knows that each guest will eat one fourth of a whole pizza pie, he can multiply the amount of guests (16) by one fourth. This will give him a total of  $16/4$  or 4 whole pizza pies.
- Equation to Match the Story:  $(2 \times 8) \times \frac{1}{4} = n$ ; Scholars are not expected to write an equation. Instead, focus on scholars' approach to the problem.
- This problem is a great opportunity for scholars to work together and solve in groups! Working in groups here will expose scholars to various ways to approach this problem and push them to construct a mathematical argument around their strategy or critique the reasoning of others.

## Challenge Problems

**19** Challenge Problem: Zhang had 11 sheets of stickers with 7 stickers on each sheet. He got 5 more sheets of stickers with 7 stickers on each sheet. How many stickers does Zhang have?

- Type: M, JRJ
- Answer: 112 stickers
- Equation to Match the Story:  $11 \times 7 + 5 \times 7 = n$ ; Scholars are NOT expected to write this equation.

**20** Challenge Problem: Ms. Sorenson unpacked a new shipment of notebooks. She unpacked 18 notebooks from one box, 36 notebooks from a second box, and 42 notebooks

from a third box. Now she wants to put the notebooks onto 6 tables with the same number of notebooks on each table. How many notebooks will she put on each table?

- Type: JRU, PD
- Answer: 16 notebooks
- Equation to Match the Story:  $18 + 36 + 42 = 6 \times n$ ; Scholars are NOT expected to write this equation.

**21** Challenge Problem: A farmer had 19 gallons of water. During a rainstorm, he collected 42 more gallons of water. He needs to store the water in jugs that each hold 10 gallons. How many jugs does he need?

- Type: JRU, MD (remainder)
- Answer: 7 jugs
- Equation to Match the Story:  $19 + 42 = n \times 10$ ; Scholars are NOT expected to write this equation.

**22** Challenge Problem: Max was preparing for a family reunion dinner. He spent \$436 on food and \$221 on beverages. His sister Jocelyn bought decorations for the family reunion dinner. Jocelyn spent \$364 more than Max. How much money did Jocelyn spend on the family reunion dinner?

- Type: PPW-WU, CQU
- Answer: \$1,021
- Equation to Match the Story:  $436+221+364=n$

**23** Challenge Problem: Marisa baked 17 peanut butter cookies, 18 oatmeal cookies, and 19 chocolate chip cookies for the bake sale. She put 6 cookies in each bag. If she sold each bag for \$3 each, how much money did she make?

- Type: N/A
- Answer: \$27
- Equation to Match the Story:  $(17+18+19)/6 \times 3 = n$ ; Scholars are NOT expected to write this equation.

**24** Challenge Problem: Fourth grade challenged fifth grade to a reading contest. Fourth grade read 278 pages on Monday and 445 pages on Tuesday. Fifth grade read 219 pages on Monday and 326 pages on Tuesday. Which grade won the contest, and by how many pages did they win?

- Type: JRU, CDU
- Answer: Fourth Grade, 178 pages
- Equation to Match the Story:  $(278+445)-(219+326)=n$

**25** Challenge Problem: There are 8 children that each want to eat half an apple. If they buy a package of 5 apples, how many apples will be left over after they've eaten?

- Type: SRU, M-MG
- Answer: 1 apple
- Equation to Match the Story:  $5 - (8 \times 1/2) = n$ ; Scholars are NOT expected to write this equation.

**26** Challenge Problem: Jeremiah baked a pie for his birthday. He gave it to his 2 sisters and told them to share fairly. Then, he decided to bake pie for his 4 brothers. He wants to give each brother the same amount that he gave each sister. How many pies does he need to bake for his brothers?

- Type: PD-ES, Equivalencing

- Answer: 2 pies
- Equation to Match the Story: Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**27** Challenge Problem: Betty is trying to figure out how long her 18 mile bike trip will take. If the first 2 miles of the trip took 20 minutes, how many hours will her whole trip take?

- Type: N/A
- Answer: 3 hours
- Equation to Match the Story: Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**28** Challenge Problem: The Lakeview school district has 4 schools. In each school there are 10 classrooms. Each classroom has desks set up for their students in rows of 5 with 5 desks in each row. How many students are enrolled in the entire Lakeview school district?

- Type: Multi-step
- Answer: 1,000 students
- Equation to Match the Story:  $(4 \times 10) \times (5 \times 5) = n$

**29** Challenge Problem: The Smith Hotel has 160 rooms. Each room has 2 windows. If the window washer can wash 40 windows per hour, how many hours will it take him to wash all the hotel windows? If the window washer is paid \$9 an hour, how much money will he make?

- Type: Multi-step
- Answer: 8 hours; \$72
- Equation to Match the Story:  $(160 \times 2) / 40 = n$ ; Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**30** Challenge Problem: Krystyna owns an ice cream shop. She charges \$4 for a small ice cream cone. A large ice cream cone costs double the amount of a small cone. On Monday, Krystyna made \$160 at the shop. If she sold 16 small cones, how many people bought large cones?

- Type: Multi-step
- Answer: 12 people
- Equation to Match the Story:  $160 - (16 \times 4) = n \times (2 \times 4)$ ; Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**31** Challenge Problem: Jacky began baking cupcakes at 11:15 a.m. The cupcakes take 20 minutes to bake in the oven. The tray she is baking with can hold 8 cupcakes at a time. If she finishes baking at 3:15 p.m., how many cupcakes did she make?

- Type: Multi-step
- Answer: 96 cupcakes
- Equation to Match the Story: Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**32** Challenge Problem: Jayden is on the school soccer team. The soccer season is 9 weeks long. The team practices for 2 hours a day, 5 days a week, for the entire season. If Jayden hurt his ankle and was unable to practice for 10 days, how many hours did he spend practicing this season?

- Type: Multi-step
- Answer: 70 hours
- Equation to Match the Story:  $9x(5x2)-(10x2)=n$ ; Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**33** Challenge Problem: Trevor wants to rent kayaks. Kayak rentals cost \$14 for a half hour. If Trevor rents three kayaks for one hour and forty-five minutes, how much will it cost him?

- Type: Multi-step
- Answer: \$147
- Equation to Match the Story: Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**34** Challenge Problem: At 7:30 a.m., there were some parents waiting in the auditorium. At 7:45 a.m., 144 more parents joined them. At 8:00 a.m., another 259 parents joined them but 15 minutes later 89 of those parents left. Now there are 368 parents in the auditorium. How many parents were in the auditorium at 7:30 a.m.?

- Type: Multi-step
- Answer: 54 parents
- Equation to Match the Story:  $(n + 144 + 259) - 89 = 368$ ; Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**35** Challenge Problem: A soccer team raised \$363 in September and \$547 in October. The team used \$600 to purchase new uniforms and wants to use the remaining amount to purchase new soccer balls. Each ball costs \$10. How many soccer balls can the team buy?

- Type: Multi-step
- Answer: 31 soccer balls
- Equation to Match the Story:  $(363 + 547) - 600 / 10 = n$ ; Scholars are not expected to write an equation. Instead, focus on scholar's approach to the problem.

**36** Challenge Problem: At her bakery, Breanna bakes bread from 3:00 a.m. to 6:00 a.m. She bakes 6 loaves of bread every 10 minutes. In the morning she sold 42 loaves of bread. How many loaves of bread does she have left to sell for the rest of the day? If each loaf costs \$3, and the bakery sells every loaf by the end of the day, how much money did Breanna make?

- Type: Multi-step
- Answer: 66 loaves; \$324
- Equation to Match the Story: Scholars are not expected to write an equation. Instead, focus on scholars' approach to the problem.

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