

4th Grade

Number and Operations
in Base Ten

Tasks

and

Answer Key

NUMBER AND OPERATIONS IN BASE TEN: TASKS OVERVIEW

Resources:

Attached you will find a set of **7 tasks for Number and Operations in Base Ten**. These tasks are interchangeable with the practice items. If your students, or a group of students, are ready for problems that are a bit more rigorous, feel free to use the tasks. The tasks are best used by partners or small groups. Since these tasks are more in-depth than the practice items, you would not want to use them every day. It is not unusual to spend the entire math class on a high-level task. You could use them once or twice a week, or if they address a standard you are working on that day, you could use them as the foundation of your lesson.

The purpose of using tasks is to help you see how students solve problems, and understand their thought process while they work. Students working with others and engaging in productive discourse, explaining their thinking to another student, and developing a solution, is the most effective way to get to student understanding. These tasks require students to do just that: think about an efficient strategy to solve the problem, show their work and justify their reasoning. This is the ultimate goal for what we want students to be able to do. Being able to gather evidence of student learning and misconceptions in the moment, will give you the flexibility to change your instruction to meet their needs. As the instructional decision-maker, you are able to adjust your methods for whole class or small groups to address student misconceptions and move them toward proficiency.

The goal is to have tasks that can be interchanged with the practice items when needed. There are tasks that represent the 5 domains in 4th grade. We would like for you to use these tasks along with the practice items for a 10 week period between the time you receive them and the end of January.

At the end of each task packet, you will find an answer key for your use. Some tasks include possible responses that students might have on the constructed response items.

Recommendations or Tips:

When implementing the tasks with your students, please take the time to have the students read through the tasks before starting to see if they have any questions about vocabulary or what the task is asking them to do. Taking the time to do these things now, will help assure that the students are familiar with mathematical vocabulary and different question types before the actual test.

Providing Feedback to Students:

Since the purpose of the tasks and practice items is to get at student understanding, it is not enough just to give them as bell ringers or engagement items. A key part of the process in advancing student thinking is to debrief the tasks and provide specific feedback on the student's thinking and performance. The key to getting at student understanding and thinking is to always have them explain how they solved the problem. This can be done during the sharing out process by asking effective questions. It is difficult to make student thinking and understanding visible by just letting students solve the problems and determining whether their response is correct or incorrect. Asking questions similar to the ones below can help students verbalize the reasoning for their solutions:

- To solve the problem, what concept do you have to be aware of?
- Why do you think your solution is correct?
- What strategy did you use to solve the problem? Why did you use that particular strategy?

- Is there another strategy that you could use to solve the problem?

The above questions can be used with **short response** and **constructed response** also. Other questions to consider when prompting students to verbalize or justify their thinking are:

Monitoring as students work:

- What is the problem asking you to find?
- How would/did you start the problem?
- What else do you need to do?

During debriefing:

- What did the problem ask you to do?
- What information do you see in the problem?
- What did you do first to solve this problem?
- Who else started this same way?
- What did you do next?
- Who started a different way?
- What are some strategies that you heard today that you would like to try when solving a similar problem in the future?

Another option is to let the groups draw out their solution(s) to the task on chart paper, or use a document camera to display and explain their thinking to the class. They can then share out with the whole class. With this option the students are able to present their thinking, justify their reasoning, and answer questions from the other students.

Answer Key:

The information above is intended to help teachers get at student understanding of the mathematical idea(s) in each problem. Also provided is an Answer Key for each set of tasks. The Answer Key provides more information on the expected student response for each task, as well as the standard being addressed. While it is important for students to get the answer right, it is equally important for them to understand how their thinking leads or does not lead to a correct solution. Incorrect solutions set the stage for teachable moments!!!!

Name: _____ Date: _____

Task 1 – Standard #6

Packaging Soup Cans

There are 202 soup cans in the factory. A crate will hold 200 cans. A case will hold 20 cans. The rest of the cans go into individual boxes. The factory wants to use as few packages as possible.

1. How many crates, cases, and individual boxes will you need to hold the 202 soup cans? *Show your work and explain your reasoning.*
2. If you only had cases and individual boxes, how many of each would you need? *Show your work and explain your reasoning.*
3. If you only had individual boxes, how many would you need? *Show your work and explain your reasoning.*
4. What did you notice about the number of cases in Part A compared to Part B? *Explain your reasoning.*

Name: _____ Date: _____

Task 2 – Standards #6 and #10

Thousands and Millions of Fourth Graders

Part 1:

There are almost 40 thousand fourth graders in Mississippi and almost 400 thousand fourth graders in Texas. There are almost 4 million fourth graders in the United States.

We write 4 million as 4,000,000. How many times more fourth graders are there in Texas than in Mississippi? How many times more fourth graders are there in the United States than in Texas? Use the approximate populations listed above to solve.

Show your work and justify your reasoning.

Part 2:

There are about 4 thousand fourth graders in Washington, D.C. How many times more fourth graders are there in the United States than in Washington, D.C.?

Show your work and justify your reasoning.

Name: _____ Date: _____

Task 3 – Standard #8

Planning a Pizza Party

The following classes are having an end of the quarter pizza party for their good behavior:

Teacher	# of students participating
Mr. Thomas	23
Mrs. Little	25
Mrs. Jones	16
Mrs. Gordon	24

Part 1:

- 1) **About how many** students are participating in the pizza party?
- 2) How close was your estimate in question 1 to the **actual answer**? *Show your work for your solution to the actual answer.*
- 3) Explain why your estimate was different from your actual answer.

Part 2: Show your work

- 4) One pizza will feed 4 students. How many pizzas are needed for all of the students?
- 5) If each pizza costs \$12.75 about how much money will be spent on pizza?
- 6) About \$324 is spent on the cost of pizza and drinks. Based on your solution for question 4, **about how much** money will be spent on drinks? Explain how you found your answer.

Name: _____ Date: _____

Task 4 – Standard #10

Who Has a Bigger Garden?

In eastern North Carolina, three farmers are having a discussion about who has the largest garden.

Mr. Sanchez: My garden is 87 yards long and its width is $\frac{1}{3}$ of its length.

Mrs. Thompson: My garden's width is 18 yards less than the width of Mr. Sanchez' garden. Its length is 8 yards longer than the length of Mr. Sanchez' garden.

Mr. Peterson: My garden is square and has a perimeter of 204 yards.

Part 1: Show your work.

What are the dimensions of each garden?

Part 2:

List the gardens in order from smallest to largest area.

Name: _____ Date: _____

Task 5 – Standard #10

College Basketball Attendance

Part 1: Show your work.

The college student sections at college basketball games vary. UNC Chapel Hill has 1,197 seats reserved for their Carolina students. If students are only allowed to go to 1 game per season, how many different students can go to 6 games?

Part 2: Show your work.

Meanwhile, UNC Charlotte only has 874 seats reserved for college students. If students are only allowed to go to 1 game per season, how many different students can go to 6 games?

Part 3:

How many more students can go to Carolina games than UNC Charlotte games? Explain how you found your answer.

Name: _____ Date: _____

Task 6 – Standard #11

Dividing by Multiples of Ten

Part 1: Show your work and explain your reasoning.

Use pictures and numbers to explain how 27 divided by 3 is related to 270 divided by 3 and 2,700 divided by 3.

Part 2: Show your work and explain your reasoning.

Prove that 23 divided by 4 is the same as 230 divided by 40.

Name: _____ Date: _____

Task 7 – Standard #11

Packaging Cupcakes

The cupcake factory packages cupcakes into packages of 3, 6, and 9 cupcakes each.

Part 1: Show your work.

They have 1,782 cupcakes to package. The company's leaders want to divide the cupcakes so that an equal number of cupcakes will be put into the 3 different types of packages. How many cupcakes will go into each type of package?

Part 2: Show your work.

How many packs of cupcakes will have 3 cupcakes in each pack? How many packs of cupcakes will have 6 cupcakes in each pack? How many packs of cupcakes will have 9 cupcakes in each pack?

Part 3:

Explain how you got your answer to Part 2 above.

So:

40,000 is 10 times 4,000

400,000 is 10 times 40,000.

4,000,000 is 10 times 400,000.

Thus, $400,000 = 10 \times 40,000$, and there are about 10 times as many fourth graders in Texas as there are in Mississippi.

Also, $4,000,000 = 10 \times 400,000$, and there are about 10 times as many fourth graders in the US as there are in Texas.

Finally, to go from 4,000 to 4,000,000, we have to multiply by 10 three times. We see that: $10 \times 10 \times 10 = 10 \times 100 = 1000$

So there are about 1,000 times as many fourth graders in the US as there are in Washington DC.

Task 3: Planning a Pizza Party

Solutions:

1) $20+20+20+20= 80$

2) Actual: 88 students

3) Possible answers could include: "When we rounded to the tens place and added the rounded numbers we got 80 for the answer."

4) 88 divided by 4 is 22 pizzas

5) We could round both numbers: $20 \times \$13 = 260$. We could round only the pizza $22 \times 13 = 286$. Either is acceptable.

6) 324 minus the answer to number 5. Answers could be 64 or 38.

Task 4: Who Has a Bigger Garden?

Part 1:

Mr. Sanchez: 87×29 ,

Mrs. Thompson: 95×11

Mr. Peterson: 51×51 .

Part 2:

Mrs. Thompson: 1,045 square yards

Mr. Sanchez: 2,523 square yard

Mr. Peterson: 2,601 square yards.

Task 5: College Basketball Attendance

Solutions:

Part 1:

$$1,197 \times 6 = 7,182$$

Part 2:

$$874 \times 6 = 5,244$$

Part 3:

$$7,182 - 5,244 = 1,938$$

Task 6: Dividing by Multiples of 10

One component of understanding the relationship between multiplication and division is understanding how multiples of 10, 100, or 1000 affect products and quotients. In these explorations, students work with multiples of 10 as divisors to understand how they relate to the quotient.

Solutions:

Students use at least two different ways to divide multi-digit numbers accurately. They are able to explain how multiples of 10, 100, or 1000 affect products and quotients.

Task 7: Packaging Cupcakes

Solutions:

Part 1:

1,782 divided by 3 = 594 cupcakes per type of package.

Part 2:

3 packs: 594 divided by 3 = 198 packs; 6 packs: 594 divided by 6: 99 packs; 594 divided by 9: 66 packs.

Part 3:

The explanation is clear and accurate.