

100th Birthday Celebration

We are planning a 100th birthday celebration in our classroom. We have 100 balloons with which to decorate the tables in our classroom. There are 6 tables and 20 students in our class. What is the best number of students to seat at each table, and how many balloons should decorate each table?

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100th Birthday Celebration

Suggested Grade Span

Pre-K-2

Task

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Alternate Versions of Task

More Accessible Version:

We are planning a 100th birthday celebration in our classroom. We have 100 balloons to use as decorations. We want to put $\frac{1}{2}$ the balloons in the front of the classroom and $\frac{1}{2}$ in the back of the classroom. How many balloons will be put in each place? There are 5 tables and 20 students in our class. What is the best number of students to seat at each table?

More Challenging Version:

We are planning a 100th birthday celebration in our classroom.

Help us with the following:

There are 6 tables in all that need to be decorated. We have 100 balloons with which to decorate the tables. How many balloons should be placed at each table so that there is the same number of balloons at each table?

There are 20 students in our class. We have 100 candies to give out to students. How many candies should each student get?

With 20 students and 6 tables, what is the best number of students to seat at each table?

We have 100 ounces of punch to give each student. If each student gets a $\frac{1}{2}$ -cup of punch, will there be enough punch for every student?

Context

During the month of February, our multi-age first-second grade classroom planned a 100th day in-school celebration. The students had investigated many different activities involving counting

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and grouping objects to 100 in partners, and each student had a homework task to bring in 100 of something for extended activities during the week.

What This Task Accomplishes

This task assesses students' number sense by using real-world materials, and using numeration skills in counting and grouping to find a solution to the problem. There is also use of patterns and relationships with seating children at the tables, and grouping balloons.

What the Student Will Do

The students will begin by diagramming the six-table arrangement in the classroom. Next the students will need to decide how they will group the 20 children at the six tables. A hint was provided: "Look at our daily cooperative groups." (They sit in groups of three or four.) The task was open for the students to choose whatever grouping they wanted for the tables. Next, the students could use their baggies of 100 objects brought in from home, or use a variety of math manipulatives available in the classroom to represent balloons to place at tables. Some students chose not to use manipulatives and went right to creating diagrams to illustrate their solutions.

Time Required for Task

60 minutes

Interdisciplinary Links

I integrate a variety of math literature to facilitate many problem-solving tasks in the classroom. Delightful new counting books by Betsy Bowen called, *Gathering: A Northwoods Counting Book*, and *A Cache of Jewels and Other Collective Nouns*, by Ruth Heller, both provide activities to count to higher groupings of objects in engaging artistic formats. The children can paint realistic groupings of objects such as a gaggle of geese, a pod of whales, or a swarm of 35 bees. Student partners can explore the classroom to find groups of objects they would like to illustrate and write math sentences based on those objects. By using the book *Gathering: A Northwoods Counting Book*, students can relate to the real-world activities that occur during the four seasons in the northeast. Independent or cooperative calendar art or a big book could be developed for groupings of objects suggested from the book or brainstormed by the students.

Other activities included making large mitten puppets. The children filled their mittens with 100 objects of different sized materials to estimate and solve what they thought would fill the mitten. Real mittens were also used to make comparisons. The baggies of 100 objects that were brought from home were sorted by different attributes, weighed, counted, swapped, illustrated and some were eaten! To expand our constellation theme, 100 mini-marshmallows were provided to each cooperative group to design and name their own constellations in clusters of 10.

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Teaching Tips

It is important for the students to have many opportunities to explore 100 objects by counting, sorting, describing, measuring and grouping them in a variety of ways. The students had practiced grouping and looking for patterns of objects in threes, fives, sixes and 10s. I had brought in 100 balloons and we had discussed and estimated the amount of space they would take up when they were all blown up. We had also used one minute and three minute timers to see if partners could keep the inflated balloons from touching the floor.

The task was a more difficult one for the class to solve with the different components. Next time I would have the children practice seating themselves many different ways, perhaps looking at more equal groups throughout the room at the six tables. I also would give each table 100 balloons in a baggie and have the groups take turns distributing all the balloons to investigate how many different ways it could be done. I often have an extra adult work with my students with special needs so they can dialogue more throughout the task while trying different strategies. It is important in a multi-age setting to provide adequate prior experiences for those that need it, while encouraging others to excel that have more skills.

Suggested Materials

- Baggies of 100 balloons
- Baggies of 100 similar objects collected from home or other classroom manipulatives
- Six tables

Possible Solutions

This problem allows for students to come to a solution in different ways. It depends on how they group the 20 students at the tables, how they equally divide the balloons, and if they use the total of the 100 balloons. I anticipated that many students might use the six table groupings in the classroom, and notice that there are usually three or four children at each table. The students had been practicing grouping by fives which was a strategy they could use for the solution.

One possible solution was:

Three children with five balloons each = 15 balloons

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Three children with five balloons each = 15 balloons

Three children with five balloons each = 15 balloons

Four children with five balloons each = 20 balloons

Four children with five balloons each = 20 balloons

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20 children and 100 balloons

There are other combinations of children and groupings of balloons that will provide a solution to this problem.

More Accessible Version Solution:

There would be 50 balloons in front of the classroom and 50 balloons are put in the back of the classroom ($100 \div 2$).

Four kids at each table ($20 \div 5$).

More Challenging Version Solution:

There would be 16 balloons could be placed at each table. There would be four balloons that could be placed elsewhere in the room.

$100 \div 20 = 5$ candies for each kid

$20 \div 6 = 3$ students at each of 4 tables, and 2 tables with 4 students

100 ounces of punch \div 4 ounces ($1/2$ cup)= 25 servings, so yes, there is enough

Task Specific Assessment Notes

Novice

This student did not use the resources in his/her immediate classroom environment to assist him/her in solving the task. The lack of a strategy in grouping the 20 students at the six tables and the 100 balloons is indicated by his/her many errors in the diagram.

Apprentice

This student has some understanding of the problem. There is evidence of a strategy to group the 20 children and the balloons evenly at the six tables. The student did not complete the grouping of the balloons accurately at the tables, which resulted in 106. There is use of appropriate mathematical representation, but this did not lead to a full solution.

Practitioner

This is a "differently abled" student whose success I am celebrating because of their independent work on this task! This student looked at the seating of the students, and internalized the skill of counting by fives as a strategy that led to a full solution. There is not a lot of mathematical language, but the representation is clear, accurate and it shows the student understood the major concepts.

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Expert

This student shows a very efficient strategy and deep understanding of the problem. The student effectively grouped the 20 students, used groupings of five balloons accurately to represent 100, and wrote a mathematical sentence. This student clearly communicates a beginning understanding of multiplication by the notation "20 fives equal 100."