

3 1/2 minutes



33 minutes

**Public Class Work:** Posing today's problem

The teacher says: "Imagine we want to send a present to our friends. A present that has a long and narrow shape. The post office has six different shapes of boxes. They are on the table—box 0, box 1, 2, 3, 4 and 5. Sit together in groups of three and one group of two. Each group will receive a box. Start observing this box. There are instructions in common that they give together with the box. Look to see what your box number is, the measurements, the dimensions. Take one of these straws, try to find the position in which the straw can be placed to obtain the longest straw."

**Private Class Work:** Students work in groups to solve the problem

A student from each group gets a box and a straw from the table. After finding the position in which the straw is the longest, students are instructed to cut it, measure it, and write a draft of their calculations trying out the reasoning that they had.

Each student receives a worksheet and is instructed to complete the space where the number of their group's box is. After each group is finished, the teacher asks them to complete a transparency with the results they have found.

The teacher circulates from group to group as the students are working on the problems, making comments and asking questions.

Several students mention using the Pythagoras theorem to calculate the length of the straw, which is the length of the hypotenuse.

The teacher asks a group of students how they completed the worksheet.

Teacher: "What did you apply by doing these calculations?"

Student: "Pythagoras theorem in solid geometry."

**IL ... NELLA GEOMETRIA SOLIDA**

Nel parallelepipedo rettangolo qui a fianco disegna con un colore la cannuccia più lunga che è possibile inserire. Se il parallelepipedo avesse le misure della vostra scatola quale sarebbe la lunghezza della cannuccia? Inserisci le misure nel disegno e scrivi in modo chiaro i calcoli e il risultato.

SCATOLA (grandezza)	DIMENSIONI (lunghezza x larghezza x altezza)	LUNGHEZZA CANNUCCIA (calcolo e risultato)
0	22,9 x 16,2 x 4 cm	
1	22,9 x 14,7 x 9,5 cm	
2	32 x 22,4 x 12 cm	
3	33,5 x 31,5 x 13 cm	
4	48,5 x 26 x 16 cm	
5	32 x 11,2 x 11 cm	

The teacher instructs students to complete their solutions in their exercise book: "The calculations in blue, the solutions in red."



7 1/2 minutes

**Public Class Work:** Discussing two methods for finding a solution

The teacher puts the transparency on the overhead. They begin with box 0, the most shallow box. The teacher names the longest straw, the diagonal. The teacher says that all of the groups used the method of first finding the diagonal of the base and then the diagonal of the box. She then mentions that a student tried to find a single possible calculation to find the length. She asks two students to show their method (using box 1). One student comes to the blackboard to explain. The teacher asks the class to observe the difference between the written calculation on the overhead and the calculation the student writes on the blackboard.

Box 1 overhead:  $\sqrt{22.9^2 + 14.7^2} \approx 27.2\text{cm}$   
 $\sqrt{27.2^2 + 9.5^2} \approx 28.8\text{cm}$

Blackboard:  $\sqrt{(22.9^2 + 14.7^2) + 9.5^2} =$   
 $\sqrt{(22.9^2 + 14.7^2) + 9.5^2} \approx 28.8\text{cm}$

Student says: "we simplified—we took away the root and we squared it. The result was the same". The teacher notes that this is the shorter way to find the diagonal.

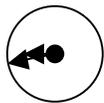
**Private Class Work:** Working on a sheet of exercises

The teacher asks students to complete the worksheet with the measurements of the other boxes.

She gives students who are finished a sheet of exercises to work on with their partner.

**ESERCIZI TEORICI DI STATISTICA NELLA GEOMETRIA SOLIDA**

- Il cubo ha un lato di 4 cm. Calcola la sua superficie e il volume.
- Un rettangolo ha per dimensioni 5 cm e 3 cm. Calcola la sua superficie e il volume.
- Un cubo ha un lato di 3 cm. Calcola la sua superficie e il volume.
- Un rettangolo ha per dimensioni 6 cm e 4 cm. Calcola la sua superficie e il volume.
- Un cubo ha un lato di 2 cm. Calcola la sua superficie e il volume.
- Un rettangolo ha per dimensioni 8 cm e 5 cm. Calcola la sua superficie e il volume.
- Un cubo ha un lato di 1 cm. Calcola la sua superficie e il volume.
- Un rettangolo ha per dimensioni 10 cm e 7 cm. Calcola la sua superficie e il volume.
- Un cubo ha un lato di 5 cm. Calcola la sua superficie e il volume.
- Un rettangolo ha per dimensioni 12 cm e 9 cm. Calcola la sua superficie e il volume.



5 minutes