



Analyzing

Students check how far their toy cars will travel and count how many toy cars have covered the short, the medium and the long distance.

The students will represent the result of the survey, that is the distances their toy cars have traveled, in a freely chosen form.

How many toy cars have traveled the longest distance? How many of them have traveled the medium distance? How many of them have traveled the shortest distance?

Materials:

- toy cars – one for each student,
- adhesive tape to mark the tracks,
- tailor's tape measure (or a longer ruler),
- A4 sheets of paper and markers in various colors for each group.

Preparation:

Arrange for some free space in the classroom, in the corridor, or on the sports field. Choose a place with a flat surface so that cars can move freely on it.

Stick the tape on the floor and mark three different distances, for example 2, 4 and 6 m on it. Adjust the distances to the size of cars you're going to use.

Course:

The students release their toy cars in turn and check the distance their vehicles have covered.



Do not remove the toy cars that have come to a halt. Alternatively, you can put them in order, so that it is clearly visible how far each toy car has traveled. You can also mark distances on the masking tape.

Once all the students have completed the task, ask them the following questions:

What can be measured?

Why do people measure things and phenomena?

What can be measured in this case?

What distances can we distinguish?

How to collect information on the distance the toy cars have covered?

How can it be written down or drawn?

- The students perform the subsequent part of the task in groups of five.
- Give each group A4 sheets of paper and markers in various colors. The students wonder how to record the information they have collected, so that others could benefit from it; next, they try to present the information in a graphical form on the sheets of paper (they devise the form in which the data is to be presented on their own).
- Once the task is completed, the students share their findings concerning the methods of data representation.



Analyzing

Having measured the heights of all their classmates, the students represent the data they have collected in the form of a histogram.

The students will check the distribution of height among all their classmates. They will present the results of their research in the form of a histogram.

Materials:

- masking tape,
- a marker,
- post-it notes in four colors (the number of colors should correspond to the number of height ranges drawn on the sheet of paper),
- measuring tape or tailor's tape measure (one for each group),
- a ruler or a hardcover book (one for each group),
- sheets of paper on which the heights of the students will be written down (one for each group).
- **Course:**

The students:

They should divide themselves into several groups, a few persons each.

Their task is to measure the height of every member of their group and write down the data on a sheet of paper:

1. Each group chooses some space on the wall and sticks a piece of masking tape vertically on the wall, up to the height of about 160 cm (5 ft 24 in) – so that it forms a vertical line.
2. The student whose height is being measured at a given moment should stand against the wall (upright, feet together, heels and head touching the wall).
3. One member of the group puts a ruler or a book on the top of the student's head so that it touches the wall. Another person marks on the masking tape the point in which the lower edge of the book touches the wall; next (once the student being measured has moved away from the wall), that other person measures the distance between the point marked on the tape and the floor level, and writes down the height on a sheet of paper.



It is likely that sticking the pieces of tape on the wall will require your help. However, the students should take the measurements themselves.

The teacher:

1. Stick the masking tape to the chalkboard, wall or door in such a way that it forms two axes:
 - the vertical axis concerns the sample size – the frequency of a given feature (it shows how many times a given feature occurs within a given range; in the case of histograms created during the lesson, this will be the number of students whose heights fall within a given range);
 - the horizontal axis includes class ranges of a given feature (in the case of height, the units will be centimeters or feet).
2. Create ranges along the horizontal axis, from the smallest value to the largest value, for example 100–110 cm (3 ft 2 in – 3 ft 6 in), 111–120 cm (3 ft 7 in – 3 ft 9 in), 121–130 cm (4 ft – 4 ft 2 in), and 131–140 cm (4 ft 3 in – 4 ft 6 in). Assign one color of post-it notes to each range.

Once the data on the heights of all students in the class is collected, the students prepare a bar graph. Based on the height measurements, each student determines the range their height falls into. Next, they pick a post-it note of an appropriate color and stick it on the chalkboard above the horizontal axis (above the appropriate range). The first student sticks his or her note just above the axis, and then the other students stick their notes in turn. In this way, bars of the graph are created.