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Resource ID#: 38659

Primary Type: Lesson Plan

Collecting Data Through the Holidays

This lesson focuses on the use of tally tables, numerical tables, and bar graphs to collect data using holiday based questions. Students will find out who collected candy on Halloween, who ate corn on Thanksgiving, who left cookies for Santa on Christmas, etc. Teachers will make up their own questions in order to make the data collection relevant to their class.

General Information

Subject(s): Mathematics
Grade Level(s): 1
Intended Audience: Educators

Suggested Technology: Microsoft Office

Instructional Time: 4 Hour(s)

Resource supports reading in content area: Yes

Freely Available: Yes

Keywords: tally marks, tally table, table, bar graph, data

Instructional Component Type(s): Lesson Plan

Resource Collection: CPALMS Lesson Plan Development Initiative

Attachment

Holiday_Activities_Interview.docx
Holiday_Graphing_Ideas.docx
Tally_Numerical_Tables.docx

Lesson Content

Lesson Plan Template: General Lesson Plan
Learning Objectives: What should students know and be able to do as a result of this lesson?
In this lesson, students will complete a tally chart, a table, and a bar graph using data collected about different holiday activities.

Students will understand how information (data) is represented in different forms.

Students will be able to discuss the data collected with other students who collected data and received different results.

Students will use the information to compare the data collected from both groups.

Prior Knowledge: What prior knowledge should students have for this lesson?
Students should be able to count by ones and skip count by fives and tens.

Students should also have been exposed to tally marks and class voting to collect information.

Students should know what a bar graph looks like, but they do not have to know how to read a bar graph, as the lesson will help them read a bar graph.

Guiding Questions: What are the guiding questions for this lesson?
How do different representations of the same data help us understand more about the data?

Why should we use a tally table to help us collect the data?

Which representation (graph) allows us to see the data clearly?

Why is it important to compare the results of the data collection with another group who has also collected the same data?

Teaching Phase: How will the teacher present the concept or skill to students?

For purposes of providing examples to teach this lesson, the examples being used will make reference to Halloween. Teachers should keep in mind that this lesson can and should be taught throughout the year with different holidays in order to provide students with different graphing opportunities as their knowledge increases.

1. The teacher will introduce the lesson by having students interview each other regarding different activities that are associated with Halloween (trick or treating, wearing a costume, counting candy, watching a scary movie, etc.). See attached "Holiday Activities Interview" sheet (this sheet can be edited depending on the holiday and the activities). This interview is to be used as an ice breaker for the lesson. The information gathered here will not be used in the graphing portion of the lesson, but students will have had a chance to move around the classroom and become familiar with the activities that will be discussed as a class.

2. Students will walk around the classroom to find a student or students who participated in one of the activities on the interview sheet. The teacher will remind the students that they can only have one student listed for each activity and students cannot be listed on more than one activity. Once they have interviewed each other, students will return to their seats to get ready for the lesson.

3. The teacher will ask the students, "What did you learn from interviewing each other?" Students' answers should reflect understanding of different choices: some students participated in more than one activity (as noted when comparing different interviews), some students did not participate in any activities, and some activities had more or less participation than others. This will prepare them for the class voting and data collection.

4. The teacher will then discuss that there are different ways to show the number of votes that each activity received. The teacher will have a tally table and a numerical table (written on chart paper) up for the class to view. The activities will have been written in the appropriate rows on the tables, but the data collection area will be blank (see attached Tally/Numerical Table sheet).

5. The teacher will also show students a bar graph (any bar graph will do) and tell students that the bar graph will be the final graph that they will be working on during their independent practice.

Guided Practice: What activities or exercises will the students complete with teacher guidance?

This portion of the lesson is where teachers will guide students on how to complete each graphing representation (tally table, numerical table, and bar graph)

1. Students will be asked to vote on each activity by a show of hands, as the teacher calls out each activity. The teacher will record student answers on the tally table that was made on the chart paper. Students will have their own copy of the Tally/Numerical Table Sheet where they can record the same information that the teacher is recording on the class tables.

2. After all students have documented the information on the tally table, the teacher will tell students they will now count the tally marks and write the numbers that represent the tally marks on the numerical table (located on the same page as the tally table).

3. The teacher will go through the first two questions to show students how to count the tally marks (counting by fives, ones) and how to transfer the information to the numerical table. The teacher will circle around the room to observe students as they work on the rest of the table, making sure to check for understanding by questioning students about their work.

4. After everyone has completed the transfer of tally marks to numerical data, the teacher will transfer the tally marks from the chart paper tally table to the chart paper numerical table. Students will be able to make corrections as needed, and the teacher will be able to assess students' understanding regarding changing tally marks to numbers.

5. The teacher will hand out a teacher-made blank bar graph. (You can find a blank free template here: http://www.theteachersguide.com/pages/printouts/math/graphs/graphinglabelitwithoutnumbers.pdf) The teacher will have filled out the x and y axes with the activities used for the lesson, taken from the Holiday Activities Interview.

6. The teacher will show students how to color in the bars to match the numbers from the numerical table by completing the first bar. It is best to use a different color crayon, marker, or colored pencil for each activity so students will not become confused. Teacher will circle the room to check that students are coloring in the bar graphs correctly and stop to help students who are having difficulty.

7. The teacher will have students complete the rest of the bar graph independently for independent practice.

Independent Practice: What activities or exercises will students complete to reinforce the concepts and skills developed in the lesson?

This portion of the lesson is where students will make their own bar graphs using the data from the numerical table. Teachers will use the guiding questions to help students understand why there is a need for different types of representations when looking at data.

1. Students will complete the bar graph using the numerical table and their crayons, markers, or colored pencils.

2. The teacher will continue to observe students and help those who are having difficulty by pulling them to another area and working with them.

3. As students finish their graphs, they are to discuss the graphs with their partners. The teacher will be able to see who understands each graphing representation through their discussions with their partners.

Closure: How will the teacher assist students in organizing the knowledge gained in the lesson?

The teacher will revisit the guiding questions to ascertain understanding and knowledge students gained from this lesson.

- How do different representations of the same data help us understand more about the data?
  Students should be able to talk about how as we move from one representation to the other, it becomes easier to read the data. The tally table allows us to easily count each choice, the numerical table allows us to see which has more and which has less, and the bar graph allows us to visually see the amount of each choice.
- Why should we use a tally table to help us collect the data?
  The tally table is a quick way to count the choices.
- Which representation (graph) allows us to see the data clearly?
  The numerical table lets us see the numbers, but the bar graph draws us in because of the colors. Each allows different learners to understand the data.

- Why is it important to compare the results of the data collection with another group who has also collected the same data?
    This allows us to use the information to make changes to the interviews. We can use the data to add, eliminate, or keep some of the interview questions depending on the number of choices for each.

Once the teacher has revisited the guided questions, it will be time to meet with the other class that also worked on the lesson. Students will be partnered with a student from the other class to discuss their findings. Both teachers will be able to summatively assess student understanding based on the discussions between the students.

Summative Assessment

The learning target of this lesson is to make sure that students understand how different groups will have different data for the same question set. Once the class lesson is complete and students have worked on the different representations with the teacher and the other students, the class will be paired with another class who will have worked on the same lesson. The teacher(s) will be able to measure understanding through the discussion students from their class have with the students from the other class. Comparing the two sets of data from each class and being able to discuss the differences will show understanding of data representations through multiple sources.

Formative Assessment

Prior to the lesson, the teacher will take a class vote on something indicative to his/her class (school lunch preference, field trip choices, PE activity, etc.) and record student votes using tally marks. The teacher will have students count by fives and/or tens and ones to check understanding of using tally marks and skip counting.

Once the teacher has assessed student understanding, the teacher will introduce the lesson by telling students that tally marks are not the only way that we can record the votes we have made.

During the lesson, the teacher will visually observe students as they transfer the tally marks to numerical data and as they transfer numerical data to the bar graph. The teacher will use these observations to determine if further review or instruction is needed to continue to the independent practice portion of the lesson.

The teacher will also guide students as they discuss their findings with each other. This will allow the teacher to talk about how different groups find different results for the same information. The teacher will be able to determine if students are ready for the summative assessment, where students from this class speak with another class on what they discovered.

Feedback to Students

During the lesson, the teacher will observe students working in pairs or in groups. As part of the observation, the teacher will determine if students are working on pace, working slowly, or are working towards advanced understanding.

Students who are struggling will receive a review of the lesson through probing questions by the teacher, such as:

- "Look at the tally table. Can you tell me how many students chose...?"
- "What can you tell me about the different graphs we used, how are they the same, how are they different?"

Students will use this feedback to make changes prior to the final group assessment.

Accommodations & Recommendations

Accommodations:

For students who have difficulty with counting: Those students can be give connecting cubes to count the student responses (1 cube = 1 child)

For students who have difficulty with the sizing of the bars on the bar graph: Connecting cubes can also be used to measure the bars, with 1 cube equal to 1 child. The connecting cube tower can then be used as a ruler to draw the height and width of the bar.

Students will be working in pairs, so teachers can pair students by ability to help those who may have difficulty.

When creating each representation, the teacher can use the same color for each activity (trick or treating is blue on each graph/table, wore a costume is red, watched a scary movie is green, etc.). This will help students to visually see the information as they transfer it from one graph to the next.

Extensions:

For students who grasp the lesson on an advanced level, the teacher can have them make up their own interview and construct the graphs on their own.

Suggested Technology: Microsoft Office

Special Materials Needed:

Connecting Cubes (enough for each student to have the same number of cubes as students in the class, as needed)

Markers, crayons, or colored pencils

Chart paper (white board or chalk board can also be used)

Teacher-made tables (two columns, and the number of rows depend on how many questions class is using to collect data), copied for students

Teacher-made bar graph template (this can be hand drawn and copied for each student; y axis and x axis labels depend on what the class is using for data and how many students are in the class)

Further Recommendations:

1. The teacher-made tables are best made in MS Word or another word processing program. The columns and rows needed will be determined by what is being asked. For example: column 1 will be labeled "Activity" and column two will be labeled "Number of Students." The rows will then be labeled for each question. If the class is using Halloween-type questions, possible activities for the data set include went trick or treating, wore a costume, counted candy, watched a scary movie, etc.

2. The teacher-made bar graph is easiest when hand drawn. Teachers can draw the two lines for the x axis and the y axis. The labels for the y axis will be the

numbers that the teachers wants to use (counting by fives might be easiest) and the x axis will have the corresponding labels used from teacher made tally table and teacher made numerical table. (Teachers can also use this website to print a template of a blank graph: http://www.theteachersguide.com/pages/printouts/math/graphs/graphinglabelitwithoutnumbers.pdf)

3. The hand-drawn bar graph can also be drawn on chart paper to be used by pairs or groups of students, rather than individual students.

4. This lesson is one lesson plan, but is designed to take a few days to complete. Teachers should use this as a lesson for about one week with the final activity taking place on the 5th day.

Source and Access Information

Contributed by: Janine Fernandez
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District/Organization of Contributor(s): Miami-Dade
Is this Resource freely Available? Yes
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Aligned Standards

Name	Description
MAFS.1.MD.3.4:	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.