

## *Mathematics: The Language of STEM*

The Talent Factor

Mrs. Long

### CONTENT AND TASK DECISIONS

**Grade Level(s):** 4th

**Description of the Task:** The Talent Factor! The talent show that started it all is returning and your group gets to be the judges! Your task is to determine how many acts you will be able to see based upon the time that you are given. Students will work in small groups of 3 to find all the factor pairs for a given whole number time by manipulating counters to create a variety of equal groups and record their findings in a chart. Students will then list the multiples of each factor to discover that the original number is a multiple of each of the factors.

#### **Indiana Mathematics Content Standards:**

**4.NS.8:** Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number.

#### **Indiana Mathematics Process Standards:**

PS.1- Students will make sense of the problem and persevere in solving them by looking at the problem and the constraints on the problem in order to identify possible combinations. PS.3- Students will construct viable arguments and critique the reasoning of others by making possible combinations of items and justifying why they think it works best and by analyzing others reasoning in their group. PS.4- Students will model with mathematics by using manipulatives to represent items and quantities.

#### **Mathematics Content Goals:**

The goal is for students to be able to find all the factor pairs for a given number. Additionally, students need to understand that their number is a multiple of each factor found. Students need to be able to explain their reasoning to others.

#### **Language Objectives:**

Find all the factor pairs for a given number between 1-100 using manipulatives and charts.

#### **Materials:**

- Transparent counters
- Initial Time cards
- Extra time cards (for extension)
- Recording chart
- Time chart
- Pencil and paper

### THE LESSON

**Before:** The teacher will peak students interest by stating that the students will be the judges for The Talent Factor next week with 2 of their friends. They will need to determine how many acts they will be able to see based upon their limited amount of time by determining factors and multiples of factors for a specific number between 1 -100.

- **Activate prior knowledge** Teacher will ask students “Has anyone been to a talent show before?” (Hopefully a few students should raise their hand). The teacher will then ask those students to describe what the experience was like with prompts as needed so that all students can understand that the talent show has acts that are performed in front on an audience. The acts are evaluated by judges to determine which act is the best.
- **Be sure the problem is understood** Students will work together in groups of 3 using the manipulatives, hundred chart, and factor chart to explore the various combinations that can be created based on their time limit. Teacher will demonstrate what the manipulatives, hundred chart, and factor chart look like and how to use them. Students may use manipulatives as needed. Students must determine the factors of their number, list the multiples of each factor and determine how much time they will give each act to perform. Remind students that each act should be given the same amount of time. Groups need to determine as many combinations as they can, but must find at least 3 combinations. The group must choose one of their combinations and justify their choice to the class.
- **Establish clear expectations** Students should work together to determine all the factors of a given number, list the multiples of each of the factors and record their information on the data chart provided. Students should discuss possible combinations with their group. Once a combination has been identified, students should record their combination on the time chart. Students should show their work in the workspace as needed. Students should then continue to identify other possible combinations and continue to record their information in the data chart. Students must have at least 3 possible combinations. Students should then discuss and agree upon which combination would be best for their group and the reasons why by explaining how many acts they can see and the amount of time each act will get. Groups will then present their combination to the class and justify why they chose their combination.

**During:** During this time students will be given the materials and asked to complete the task. Remind students that they must identify at least 3 combinations within the time given. Students may continue to find more combinations and record their information on the back of the data chart if time permits.

- **Let go,** Teacher will distribute materials to groups of students and allow students to begin discussing and exploring possible combinations.
- **Listen actively,** Teacher will walk around and visit with groups to monitor discussions and listen for student thinking. If teacher notices errors in thinking then teacher will provide additional support.
- **Provide appropriate support** Teacher may need to clarify directions, model discussion techniques (ensuring that everyone in the group is participating), ask questions to prompt student thinking. Teacher may need to clarify how to find a factor pair.
- **Provide worthwhile extensions.** For groups that complete the task with extra time, teacher could extend the problem by asking what would happen to their combinations if their time were doubled or cut in half. Additionally, teacher could provide one of the extra time cards and ask the group to try to complete the task using a different time.

**After:** At this time, students exploration time will end. Teacher will have students come together as a whole group to discuss possible combinations and provide reasons for their choice.

- **Promote a mathematical community of learners** Teacher will remind students to be good audience members by sitting still, eyes on the speaker, and listening attentively. Groups will present their combination to the class using the document camera so that the rest of the students will be able to see their combination choice. Groups will explain why they chose this

combination to the class. Each group will present.

- **Listen actively without evaluation** Teacher will listen attentively to each group as they present.
- **Make connections** Teacher will help students to make connections by discussing a reasonable amount of time for each act, discussing ways of using the multiples list and factors to determine how many groups for each.
- **Summarize main ideas** Teacher will summarize the lesson by reminding students that factors and multiples can be used in a variety of ways.

## ASSESSMENT

**Observe:** Teacher will observe groups as they work to ensure that students are finding the factor pairs for their given numbers appropriately to determine possible combinations. Teacher will observe students to ensure that all students are actively participating in the group. Teacher will observe groups as they justify their reasoning for choosing their combination.

**Ask:** How many combinations did your group come up with? Which combination did your group choose and why?