**Did I Miss the Bus?**

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| In this lesson, students explore situations that involve elapsed time within the same hour. |

**NC Mathematics Standard(s):**

**NC.3.MD.1** Tell and write time to the nearest minute. Solve word problems involving addition and subtraction of time intervals within the same hour.

**Additional/Supporting Standards:**

**NC.3.NBT.2** Add and subtractwhole numbers up to and including 1,000.

* Use estimation strategies to assess reasonableness of answers.
* Model and explain how the relationship between addition and subtraction can be applied to solve addition and subtraction problems.
* Use expanded form to decompose numbers and then find sums and differences.

**Standards for Mathematical Practice:**

1. Make sense and persevere when solving problems.

3. Construct viable arguments and critique the reasoning of others.

4. Model with mathematics

6. Attend to Precision

**Student Outcomes:**

* I can represent and solve word problems about elapsed time.
* I can communicate my problem solving strategies orally and in writing.

**Math Language:**

**What words or phrases do I expect students to talk about during this lesson?**

End time, elapsed time, hour, minute, start time

**Materials:**

Activity sheet, analog clock

**Advance Preparation**:

* Gather materials

**Launch: Reviewing the Idea of Elapsed Time (5-7 minutes)**

Take an analog clock and show the class a time (e.g., 7:18). Ask, “What time it will be in 25 minutes?” Pose similar questions. Make sure that none of the tasks that you give cross over an hour.

**Explore: Exploring Did I Miss the Bus? Task (17-20 minutes)**

Distribute the *Did I Miss the Bus?* Activity sheet to students. Allow students to work in pairs or small groups.

Provide time for students to explore before jumping in. As students work, ask them questions such as:

* What is the task asking you to find out?
* What strategies are you using?
* Does your answer make sense?

When they have worked for about 15 minutes, bring the class back together.

**Discuss: Discussing the Did I Miss the Bus? task (10 minutes)**

As a whole class, have students share their strategies used to solve the tasks on the *Did I Miss the Bus?* Activity sheet. Be selective when selecting strategies to make sure that a variety of strategies are used.

If no students use a number line or expanded form provide students with the following guided question: “How could we use a number line/expanded form to help us solve this task?”

**Explore and Discuss a Follow Up Task (20 minutes)**

Give students a follow up task such as: “In the morning I walked to the bus stop, but I forgot my book. By the time I got back to the bus stop with my book it had been 7 minutes since I had left the house. I left the house at 7:06. The bus came at 7:12. Did I miss the bus? How do you know?

Allow students time to work on this task and then discuss strategies. If no students use a number line or expanded form provide students with the following guided question: “How could we use a number line/expanded form to help us solve this task?”

**Additional Activities (20 minutes)**

The following activities can be completed during the remaining time:

**What’s the Difference?**

Students work in pairs and need two number cubes and a deck of number cards. Students roll the number cubes and pull 1 number card. The number card represents the hour while the number cubes represent the minutes. If students roll a 6 on the number cube that gets used as a 0. For example, a number card with an 8 and number cubes that have a 5 and a 6 could be either 8:05 or 8:50. Students then find the difference between their two times. Students repeat this.

**Plane Times**

Have students work in pairs or small groups to complete the Plane Times activity sheet. If you want students to complete this at a teacher-facilitated center, make sure you facilitate by asking questions and do not give direct steps on how to complete the task.

**Matching Times**

Use the attached game cards and cut them out. Match up the written time with the word problem that matches that time.

**Evaluation of Student Understanding**

Informal Evaluation:

As students work, pose questions and observe them.

Formal Evaluation/Exit Ticket:

Students’ work on the activity sheet can be used as an exit ticket. Alternatively, you could also pose the following task: You wake up at 6:25 a.m. It takes you 8 minutes to take a shower, 5 minutes to get dressed, and 19 minutes to eat breakfast. What time are you done eating breakfast?

**Meeting the Needs of the Range of Learners**

**Intervention:** Students should use expanded form or base ten block drawings to help them add and subtract.

**Extension:** Challenge students to find elapsed times in follow up problems in which hours and minutes are both added or subtracted but the minutes do not cross over an hour (e.g., 2 hours and 27 minutes after 3:29 is o.k., but 2 hours and 27 minutes after 3:33 is not o.k.).

**Possible Misconceptions/Suggestions:**

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| **Possible Misconceptions** | **Suggestions** |
| Students may struggle adding or subtracting times. | Provide students with paper to draw base ten figures or use expanded form. Alternatively, you could provide physical base ten blocks if needed. |
| Students may struggle with whether to add or subtract the values in the task. | Use a number line as a timeline to help students think sequentially about the different start times, end times, and durations. |

**Possible Solutions:**

**Did I Miss the Bus?**A) No, at the bus stop at 7:36. B) Yes, at the bus stop at 7:31. C) No, at the bus stop at 7:54.

Plane Times:

|  |  |  |  |
| --- | --- | --- | --- |
| **Plane** | **Arrival** | **Departure** | **Difference** |
| 101 | 7:03 | 10:22 | 3:19 |
| 202 | 7:26 | 10:41 | 3:15 |
| 303 | 7:34 | 10:45 | 3:11 |
| 404 | 7:36 | 10:50 | 3:14 |
| 505 | 7:48 | 10:51 | 3:03 |

**Did I Miss the Bus?**

Consider each situation. For each situation did I miss the bus?

Situation A:

I woke up at 7:05. It took me 12 minutes to shower and get dressed. It took me 18 minutes to eat breakfast. I walked a minute to the bus stop. The bus came at 7:38.

Situation B:

I woke up at 7:07. It took me 6 minutes to shower and get dressed. It took me 15 minutes to eat breakfast. I walked 3 minutes to the bus stop. The bus came at 7:30.

Situation C:

I woke up at 7:09. It took me 16 minutes to shower and get dressed. It took me 27 minute to eat breakfast and read before I walked 2 minutes to the bus stop. The bus came at 7:55.

**Plane Times**

The following table represents times that planes that come through the Charlotte Airport.

|  |  |  |
| --- | --- | --- |
| **Plane** | **Arrival** | **Departure** |
| 101 | 7:03 | 10:22 |
| 202 | 7:26 | 10:41 |
| 303 | 7:34 | 10:45 |
| 404 | 7:36 | 10:50 |
| 505 | 7:48 | 10:51 |

Pick two planes and determine how far apart they arrive at the airport.

Pick a different set of two planes and determine how far apart they arrive at the airport.

Pick two airplanes and determine how far apart they depart from the airport.

Pick a different set of two planes and determine how far apart they depart from the airport.

Matching Times Cards

|  |  |
| --- | --- |
| 15 minutes later than 7:02 | 8:07 |
| 16 minutes before 8:23 | 7:17 |
| 4 minutes before half past 6 | 2:57 |
| 49 minutes past 2:08 | 6:26 |
| 9 minutes before a quarter after 1 | 3:09 |
| 14 minutes before 3:23 | 1:06 |
| 35 minutes before 8:59 | 3:53 |
| 8 minutes after a quarter until 4 | 8:24 |