Calendar Math

Strand: Measurement and Geometry

Topic: Identifying equivalent periods of time

Primary SOL: 3.9 The student will
>   c) Identify equivalent periods of time and solve practical problems
>   related to equivalent periods of time.

Related SOL: 3.9 a, b

Materials
- Equivalent Times Matching Cards (attached)
- Equivalent Times Recording Sheet (attached)
- Periods of Time activity sheet (attached)
- How Many? Task Cards (attached)
- How Many? Recording Sheet (attached)
- Calendar Game Board (attached)
- Game Cards for the Calendar Game (attached)

Vocabulary

day, equivalent, hour, minute, month, period of time, second, time, week, year

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Review the concept of time using the Periods of Time activity sheet. With a partner, have students write everything they know about each period of time under the header. Challenge them to think about information others may not know. Tell them that all information must be true and validated.

2. Compile a class record of the (accurate) information that students listed.

3. Tell students, *"The principal went on a vacation last weekend. He/she was gone for exactly two days. How many hours was he/she gone?"* Give students time to work with a partner to figure out how many hours the principal was gone. When students give their answer, ask them to explain the strategy they used to get their answer (24 + 24= 48 or 24 x 2 = 48 …) Record the different strategies on the board. Ask, *"What if the principal was gone for five days? How many hours would he/she be gone?" "Did you use the same strategy or a different one?"*

4. Next, pose this problem to students, *"The orthodontist said Kate would have to wear braces for three years. How many months will Kate have to wear braces?"* Give students time to work with a partner to solve. Have them explain their strategy when they give their solutions. Ask, *"Did you use the same strategy you used when you solved the previous problem?" "How are your strategies different? How are they similar?"*

5. Have students work in pairs to complete the Equivalent Times Matching Cards activity. Students should cut apart all cards and match the equivalent times. Have students glue

the cards to the Equivalent Times Recording Sheet and show the strategy they used to solve for each.

They should also discuss an activity that may take the amount of time indicated by the match.

6. Engage the class in a discussion on the matches and strategies used to solve for each. Are the activities reasonable for the time allotted?

Assessment

- **Questions**
  - o Why is it important (or helpful) to know how many days in a week, days in a month, days in a year?
  - o What strategy would you use to find the number of days in two years? In three years?

- **Journal/writing**
  - o Do we have the same number of days in every year? Explain your answer.
  - o Explain how you would find out how many days are in three years.

- **Other Assessments**
  - Give each pair of students a set of four How Many? Task Cards, and distribute the How Many? Recording Sheet to each student. Explain to students that they will be using the task cards to determine equivalent periods of time for days/weeks, months/years, minutes/hours, and hours/days.

    Ask students what they will need to know about units of time in order to complete each task card. (How many smaller units are in each larger unit?) Ask whether there is a pattern for determining these equivalent periods of time. Have groups discuss the solutions for each task card, and have each student record the answers on their individual recording sheets.

    Then, have a representative from each group share some of the group's answers to the task cards. Ask students whether they see a pattern, and if they do, whether there is a "rule" for the pattern in each of the cards.

Extensions and Connections (for all students)

- Give students a set of calendars for each month of the year. Have them take a calendar apart and put it together at the end of each month by cutting the blank spaces out and attaching January to February to March, etc., to create a yearlong calendar. This will enable them to see the span of time and make connections between days, weeks, months, and one year.

- Research leap year. Explain why we have leap years and why it only happens every four years.

- Have students play the Calendar Game with a partner. Each pair will need a copy of the game board, one set of the Game Cards for the Calendar Game, and two game markers for the board. *Note: You may want to make an answer key to make the game self-checking.*

- o The rules are as follows:
    - o Shuffle the game cards, and place them face down in a stack.
    - o Player 1 draws a card and must answer the question.
    - o Players must agree on the correct answer. If correct, player 1 may advance his/her marker one day on the game board.
    - o If the answer is incorrect, Player 1 does not advance, and Player 2 may draw a card and solve. Again, the players must agree on the correct answer.
    - o Drawn cards are returned to the bottom of the stack.
    - o Players continue to take turns drawing cards and answering the questions.
    - o The first player to reach END wins.

Strategies for Differentiation

- Allow students to use a calculator, if needed, for larger calculations.
- Have students keep track of the number of days into the year and the number of days left in the year on a calendar.
- Teach students the way to remember how many days are in each month, "Thirty days hath September, April, June and November. All the rest have thirty-one … except February."

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Equivalent Times Matching Cards

24 months	**3 weeks**
2 weeks	**48 hours**
21 days	**24 hours**
2 hours	**2 years**
2 days	**1 year**
14 days	**60 minutes**
1 day	**12 months**
1 hour	**120 minutes**

Equivalent Times Recording Sheet

Card 1	Card 2	Strategy to solve	Activity or Event that may take that long

Periods of Time

Hour	Day	Week	Month	Year

How Many? Task Cards

How many minutes in __ hours?

Minutes	Hours
60	
120	
	3
240	
	5

How many hours in __ days?

Hours	Days
	1
48	
	3
	4
120	

How many days in __ weeks?

Days	Weeks
	1
14	
	3
28	
	5

How many months in __ years?

Months	Years
12	
	2
36	
	4
	5

How Many? Recording Sheet

Name: _____   **Date:** _____

How many minutes in __ hours?

Minutes	Hours
60	
120	
	3
240	
	5

How many days in __ weeks?

Days	Weeks
	1
14	
	3
28	
	5

How many hours in __ days?

Hours	Days
	1
48	
	3
	4
120	

How many months in __ years?

Months	Years
12	
	2
36	
	4
	5

Write two sentences summarizing what you needed to know to complete the task cards.

1. _____

2. _____

January Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				START	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31 **END**						

Game Cards for the Calendar Game

A How many days are in a week?	**B** Cameron's Scout group meets on the second Tuesday every month. What is the date of their meeting this month?	**C** How many days are in 3 weeks?
D How many hours are in a day?	**E** How many months are in a year?	**F** Maria's dance recital is the fourth Saturday. What is the date of Maria's recital?
G How many days are in 2 years?	**H** How many Saturdays are in the month?	**I** Sam's birthday is January 14. His birthday party is two days later. What is the day and date of his party?
J What is the date of the third Monday of the month?	**K** Are there more Mondays or Wednesdays in the month?	**L** How many hours are in 3 days?
M How many days are in a year?	**N** How many months are in 3 years?	**O** How many minutes are in 2 hours?

P What is the date of the second Wednesday of the month?	**Q** How many minutes are in 5 hours?	**R** What is the date of the last Thursday of the month?
S Kelly is going on a camping trip. She will be gone exactly 48 hours. How many days will she be gone?	**T** What is the date of the third Tuesday of the month?	**U** Mary went to a movie that was 3 hours long. How many minutes long was the movie?
V How many days are in this month?	**W** What was the date 7 days before January 25?	**X** Bill delivered newspapers every day for two years. How many days did Bill deliver newspapers?
Y How many days are in 4 weeks?	**Z** What was the day before yesterday?	**AA** How many Saturdays are in this month?
BB What day of the week will it be 3 days before January 5?	**CC** Ted played hockey for 14 days straight. Chad played hockey for 3 weeks straight. Who played fewer straight days?	**DD** Kristen lived in England for 36 months. How many years did Kristen live in England?