

Title: Time After Time

Brief Overview:

Students will develop an understanding of telling time by using a wide variety of strategies and techniques. Students will use estimation to tell time using seconds, hours, and minutes in order to choose reasonable time estimates for given activities. Students will also use pictures, words and symbols in order to read, write and represent time to the nearest minute. Given a time, students will be able to count up using minutes and hours in order to determine elapsed time. Lastly, students will further their understanding of the importance of time in our every day lives.

NCTM Content Standard/National Science Education Standard:

Measurement
Problem Solving
Communication
Connection

Grade/Level:

3-4

Duration/Length:

Three – Four days for 50-60 minute periods, including assessment.

Student Outcomes:

Students will:

- Estimate equivalent measurements by determining equivalent units of time
- Identify the attributes of a clock by telling time in hours and minutes
 - Apply measurement concepts by determining start time, elapsed time, and end time

Materials and Resources:

Lesson 1

- *Time Cards* - Student Resource Sheet 1
- *Equivalent Units Chart* -Teacher Resource Sheet 1
- *Time Tag Cards* - Student Resource Sheet 2 (1 per pair)
- Ziploc baggies (1 per pair)
- Half sheet of paper for assessment

Lesson 2

- Telling Time with Big Mama Cat by Dan Harper
- Judy Clocks or *My Clock* - Student Resource Sheet 3
- *Twirling With Time Spinner* - Student Resource Sheet 4
- Two (2) paper clips
- *Twirling With Time* - Student Resource Sheet 5
- *Telling Time Assessment* - Student Resource Sheet 6
- *Telling Time Assessment Key* - Teacher Resource Sheet 2

Lesson 3

- *Defining Elapsed Time* - Student Resource Sheet 7
- Judy Clocks or *My Clock* - Student Resource Sheet 3
- *Shooting For Time* - Student Resource Sheet 8
- *Elapsed Time: Reading A Schedule* - Student Resource Sheet 9
- *Teacher Observation Checklist* – Teacher Resource Sheet 4

Assessment

- *Summative Assessment* - Student Resource Sheet 10
- *Summative Assessment Key* - Teacher Resource Sheet 3

Advanced Preparation for *Time Tag Game*:

- Since the game is similar to *Concentration* and requires students to make matches from memory, the teacher should copy *Time Tag Cards* – Student Resource Sheet 2. Once they are copied and cut out, the teacher should paste them onto index cards.

Development/Procedures:

Lesson 1

Pre-assessment –

- List the following directions on the board:
 - *Choose the most reasonable unit of time for each (Second, Minute, Hour, Day, Week, Month, and Year). Write it in the blank.*
 - Summer lasts about 2 _____.
 - Lunch is about 30 _____.
 - It takes 15 _____ to tie your shoe.
- Give students approximately 5 minutes to complete the problems and advise students to give their best guess and make sure that their answers make sense.
- Walk around the room to get an understanding of students' knowledge of the subject.
- Invite students to the board to fill in the answers.

Launch –

- Hand out the *Time Cards* - Student Resource Sheet 1 with the equivalent units of time to the students. Have the students stand at the front of the class and advise them to silently find their equivalent unit of time (partner) and place themselves in the correct order of time from shortest amount of time to the longest.
- Ask students in the “audience” to show thumbs up if they agree or thumbs down if they disagree. (If the students are not in the correct order, have a student from the audience go to the front of the room, to place the students in the correct order.)
- Call on students to ask them support their answer and begin discussion of the units of time and the results.

Teacher Facilitation –

- Have students help the teacher fill in the chart (teacher Resource Sheet 1) with the equivalent units of time. Begin discussing the length of each unit after the chart is complete. Ask, “*What is the shortest unit of time listed on the board? What is the longest unit of time?*”
- Ask students to give examples of activities that they might be able to do in a few seconds, 1 minute, 10 minutes, an hour, etc. and list on the board. Discuss activities listed on the board and tell students that we will test some of the activities listed.
- Present students with the following problems:
 - Display chart with 10-15 first names of students in class. Give students one minute to look at the names on the chart and memorize as many as they can. Cover the names after one minute and give students one minute to write as many names as they can remember.
 - Have students stand on one foot with both hands touching their shoulders for exactly one minute.
 - Ask, “*In which activity did a minute feel longer? Even though, it was the same amount of time, why did the second activity feel longer?*”
- Facilitate discussion of why it is important to choose reasonable estimates of time. Ask, “*What if I would have asked you to stand on one foot for 1 hour, or 1 week instead of 1 minute?*”
- Continue discussion to ensure that students understand the importance of knowing the *Equivalent Units Chart* - Teacher Resource Sheet 1. End discussion and teach students how to play the game *Time Tag*.

Student Application –

- Give the directions of the game and model how to play. Remove all of the cards from the baggie and place them face down on students' desks. Match the activity listed with the correct estimate of time that it should take to complete the activity.
- Invite a student to come up and be the teacher's partner to model the game for all of the students. Play as long as needed for all students to understand the activity.
- Distribute the *Time Tag Cards* - Student Resource Sheet 2 to each pair of students and have them go back to their seats to play the game.

Embedded Assessment –

- Give students a half sheet of paper and have them list one new unit of equivalent time that they learned today and give an example of something that can occur during that time. (Example, 60 minutes – 1 hour, I could do my homework for the night and read a chapter from my book.)

Reteaching –

- Have students who showed lack of understanding during teacher facilitation and game work with teacher in a small group to list more examples of activities for a period of time. Work with the students to play game, also.

Extension –

- Allow students who showed a greater understanding of the skill to make up their own examples of activities and estimates of time it should take to complete it. Share with partner to have him/her try to solve.

Lesson 2

Preassessment –

- List the following problems on the board and have students fill in the blanks with the vocabulary they used in the previous lesson.
 1. Music class is 2 _____ a week.
 2. It takes about 45 _____ to wash a car.
 3. It takes about 2 _____ to clap your hands.

Launch –

- Give each student a mini Judy Clock or *My Clock* - Student Resource Sheet 3.
- Read, Telling Time with Big Mama Cat by Dan Harper to the students. As you read, have students try to make appropriate times on their clocks. Have a student come to the book and make the appropriate time in the book that is mentioned.

Teacher Facilitation –

- Review with students the different parts of the clock (hour hand, minute hand)
- Discuss differences between an analog and digital clock.
- Have students stand in a circle and review skip counting by fives. Have them go around the circle until they reach 60. If a student miscounts, start back at zero. Continue until each child has participated.
- Review the steps for reading an analog clock. *First, read the hour hand. As time gets closer to the next hour, the hour hand gets closer to the next number. (Show them as you are going over steps with My Clock - Student Resource Sheet 3.) Then, read the minute hand. Touching the large numbers, skip count by fives as far as you can. Then count on by ones to the exact minute.*
- Ask students, “Why was it important for Big Mama Cat to know how to tell time?” (ex. So she knew when to take a nap, or knew when to eat snack.)
- Tell students there are different ways to tell time. Introduce the vocabulary words **after** and **to** (put words on sentence strips). Give them examples using the new vocabulary words.
 - “The time is 12:20 or twenty minutes after 12.”
 - “We eat lunch at 11:50 or 10 minutes to 12.”
- Tell the students a variety of times and have them make the times on their individual Judy Clocks. Have them hold up their clocks after they have made the correct times and call on students to express the time in a different way.
 - For example: 5:50 or 10 minutes to 6
 - 3:30 or 30 minutes after 3
 - 8:25 or 25 minutes after 8
- Select a student to discuss the appropriate way of telling time using the hours and minutes.

Student Application –

- Play game “Twirling with Time”. Have students work in pairs. Each pair should have their Judy Clock or *My Clock - Student Resource Sheet 3*, *Twirling With Time Spinner - Student Resource Sheet 4* and two (2) paper clips, and *Twirling With Time - Student Resource Sheet 5*.
**Note: Teacher should advise students to use two different colors to mark the hour and minute hand on Twirling With Time – Student Resource Sheet 5.*
- Open one side of the paper clip to create a spinner and have students hold the unopened end with their pencil in the middle of the spinner. Students should

take turns spinning the paper clip. Students should spin three times (unless students each spin a double digit number).

- *For example, if a student spins a 12 first, they are only going to spin two more times – to complete the time. 12:56*
- After students each spin, they should record their time in the time column. Then students should draw the hour and minute hand to represent their time spun on the clock. Lastly, students should write time in words using **to** or **after** to tell their time.

Embedded Assessment –

- Give students *Telling Time Assessment* - Student Resource Sheet 6 to assess their knowledge on telling time in different ways. Students should be allotted 10 minutes to complete the assessment. Answer Key can be found on Teacher Resource Sheet 2.

Reteaching–

- Use information from the *Telling Time Assessment* – Student Resource Sheet 6 to reteach students who seemed to struggle. Have students who showed lack of understanding during teacher facilitation and during the game, work with the teacher in a small group to list more examples of activities for a period of time. Also, pair students who seem to be struggling with students who demonstrate mastery of subject. Work with the students to play game, also.

Extension-

Students that show mastery of subject could incorporate the vocabulary quarter to and quarter after into their class work.

Lesson 3

Pre-assessment –

- Write the following prompt on the overhead or chalkboard:
 - *You and your friends decide to watch a movie. The movie starts at 6:30. If the video lasts for 2 hours and 30 minutes, what time will it end?*
- Provide students with Judy clocks or *My Clock* - Student Resource Sheet 3 to assist in solving the problem. Observe students different ways of solving the problem and diverse ways of thinking.

Launch –

- After students have had an opportunity to solve the problem, discuss the answer and strategies students used to solve the problem.

Teacher Facilitation –

- Distribute the *Defining Elapsed Time* – Student Resource Sheet 7 and have students write their definition of elapsed time. Call on volunteers to share their thoughts about elapsed time. Record responses on the board. Give students examples of elapsed time
 - *For example: from the time that school starts to the time that school ends; from the time it takes to start watching a movie to the time of the end of the movie.*
- Have students go back to their paper and revise their first definition of elapsed time. Give students approximately two minutes to formulate a definition. Call on volunteers to share their new definitions for elapsed time and record on the board. Choose one student to find elapsed time in the dictionary and read the definition aloud. Record the definition on the board for students to copy on *Defining Elapsed Time* – Student Resource Sheet 7.
- Tell students that they must come up with an icon to represent *elapsed time*. (You may need to explain what an icon is to students. For example, the golden arches are synonymous for McDonald's and you can easily imagine a cheeseburger and French fries. Elicit other examples of icons that they might know.) Give students 5-10 minutes to complete their drawings. Have students walk around the room to look at all of the drawings once everyone is finished. Ask students to vote on the drawing that they think best represents elapsed time. Winner may redraw their picture on a bigger piece of paper or heavy cardstock to be hung in the room.
- Begin modeling how to count elapsed time by counting hours first then minutes next.
- Put students in pairs and use the following problems to assist in learning. Have one student show the starting time on their clock and then have the partner move the clock the elapsed time to discover the end time.
 - ***Note:** *The end time is here for teacher assistance only. Do not tell them the end time when telling them the problem.*
 - Start time: 12:15 Elapsed time: 30 minutes End time: 12:45
 - Start time: 2:20 Elapsed time : 40 minutes End time: 3:00
 - Start time: 1:15 Elapsed time: 2 hours End time: 3:15
 - Start time: 3:45 Elapsed time: 30 minutes End time: 4:15
- After students start to show understanding of finding the end time, have students find the elapsed time. Give students start time and end time and have them find the elapsed time.
- Have students continue to work with a partner. Partner 1 should show the start time and Partner 2 should show elapsed time on their clock. Then students can work together to count hours first and then minutes to find the elapsed time.

- After students start to show understanding of elapsed time, have students try to find the starting time.
 - Start time: 1:15 Elapsed time: 25 minutes End time: 1:40
 - Start time: 6:20 Elapsed time : 30 minutes End time: 6:50
 - Start time: 7:15 Elapsed time: 1 hour End time: 8:15
 - Start time: 9:45 Elapsed time: 45 minutes End time: 10:30
 - Start time: 10:15 Elapsed time: 2 hours End time: 12:15
 - Start time: 4:35 Elapsed time: 50 minutes End time: 5:25

Student Application –

- Play *Shooting For Time* – refer to *Shooting for Time* – Student Resource Sheet 8. Break students into equal groups of four. Each team will need a Judy Clock or *My Clock* Student Resource Sheet 3. Each student will need a copy of *Shooting For Time* - Student Resource Sheet 8.
- The object of the game is for each team to score as many points as they can by shooting a ball (crumpled trash) into a hoop or basket. Given a time and the elapsed time students will show the end time on their clocks. Each team will have a team captain that will rotate after each turn (every student should have a chance to be the team captain). After the teacher gives the start and elapsed time students should determine the end time. The team captain will use the Judy Clock or *My Clock* - Student Resource Sheet 3 to determine the time and then hold up their clock. The other students on the team will record their answer on *Shooting For Time* - Student Resource Sheet 8. The first team that has their captain hold up the correct end time will have a chance to shoot a ball into a basket. Each basket made is worth two (2) points. The team with the highest amounts of points in the end wins!

Embedded Assessment –

- Use the *Teacher Observation Checklist* – Teacher Resource Sheet 4 to observe students while they are playing the game.
- Use *Elapsed Time: Reading a Schedule* - Student Resource Sheet 9 for students to demonstrate understanding of elapsed time.

Reteaching-

- Work with students who are struggling in a small group. Give students two clocks if needed to show start and end time. Also students can use *Shooting For Time* - Student Resource Sheet 8 to assist in drawing start time and end time to find elapsed time.
- Use website www.shodor.org/interactivate/activities/clock3/index.html to help struggling students.

Extension –

- While playing the game, give students the elapsed time and end time in order for the student to determine the start time.

- Have students find elapsed time over greater amounts of time. Also, have students work on determining whether the time is AM or PM.

Summative Assessment:

Students will demonstrate an understanding of time by choosing reasonable estimates for time, reading, writing, and representing time to the nearest minute, and determining elapsed time. Students will complete four questions that are fill in the blank, one selected response question, and one brief constructed response question (*Summative Assessment* - Student Resource Sheet 10). Answer key is on *Summative Assessment Key* - Teacher Resource Sheet 3.

Authors:

Nicole Barth
Baltimore Highlands Elementary
Baltimore County, Maryland

Jaime Gesl
Hawthorne Elementary
Baltimore County, Maryland

TIME CARD

60 seconds	1 minute
60 minutes	1 hour
24 hours	1 day

7 days	1 week
12 months	1 year
52 weeks	1 year
365 Days	1 year

Equivalent Units of Time Chart

60 seconds = 1 minute

60 minutes = 1 hour

24 hours = 1 day

7 days = 1 week

12 months = 1 year

52 weeks = 1 year

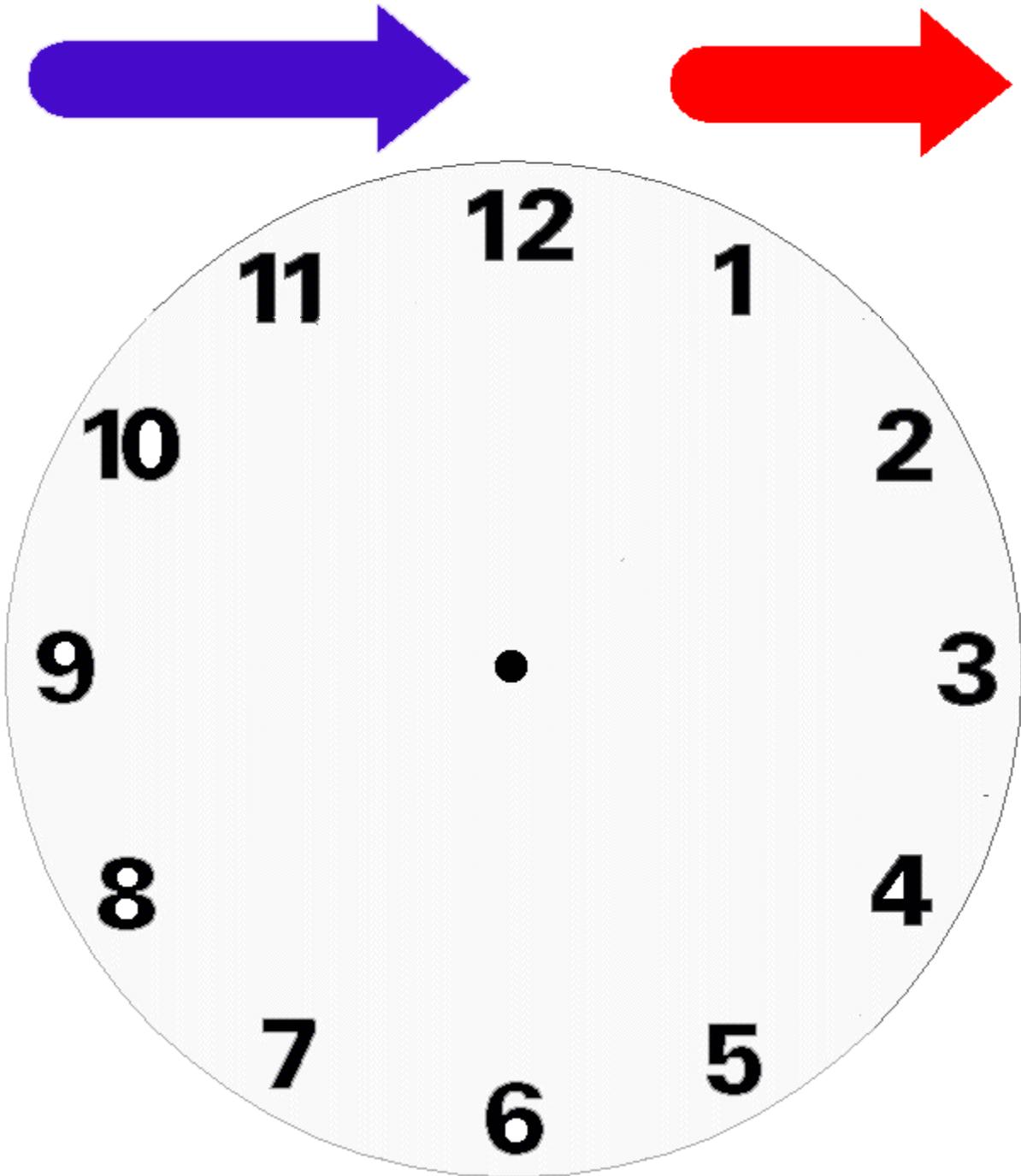
365 days = 1 year

Time Tag Cards

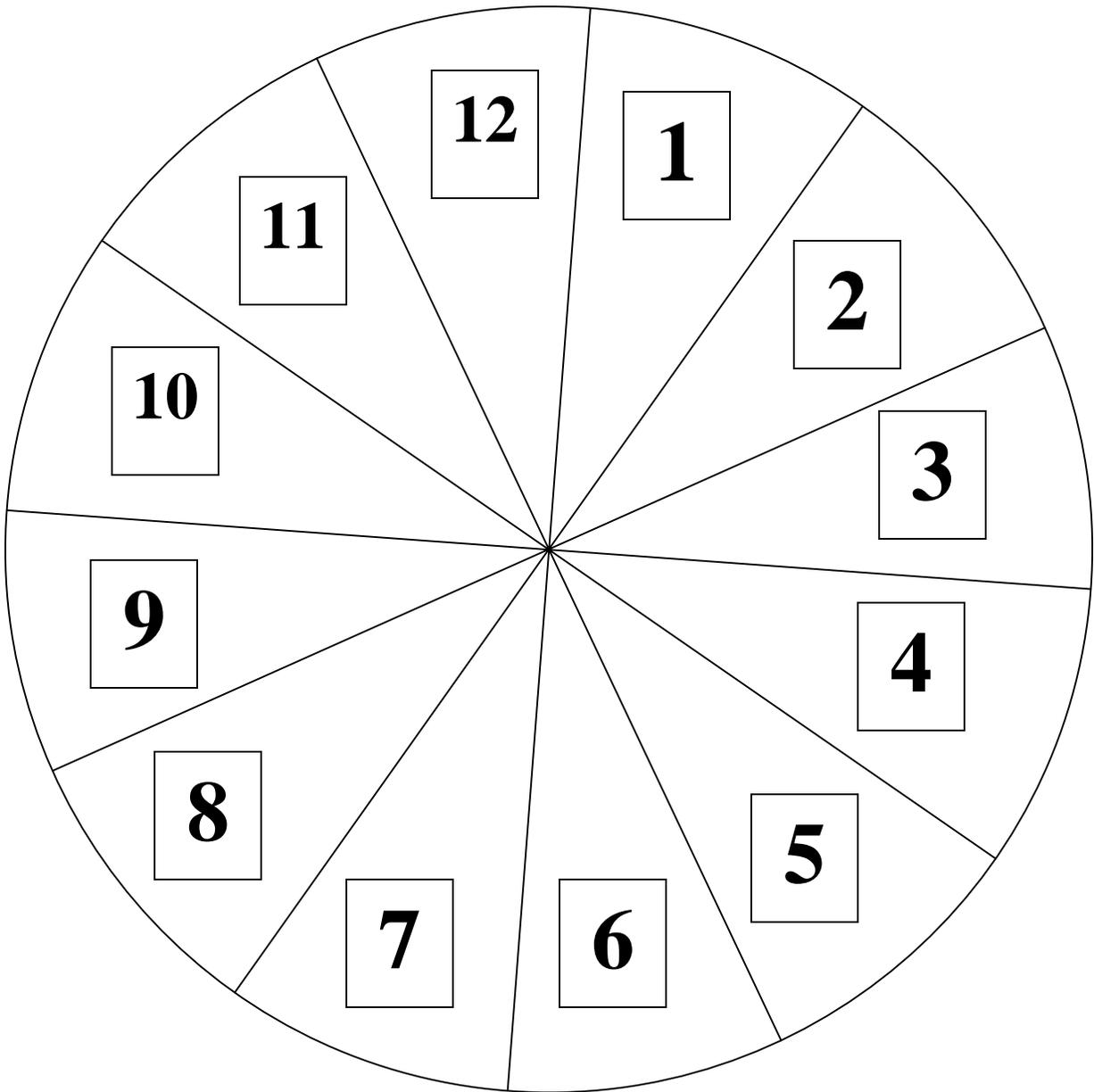
The time it takes to walk home from school	1 minute
The time it takes you to do your homework.	1 hour
The time it takes you to brush your teeth.	1 minutes
The time it takes to get a good night's sleep.	8 hours
The time it takes to watch a TV show.	30 minutes
The time it takes to go on a vacation.	1 week
The time it takes for you to grow two inches.	1 year

<i>The time it takes for you to sneeze.</i>	2 seconds
The time it takes for a school day to pass.	6 hours
The amount of weeks it takes for a month to pass.	4 weeks

My Clock

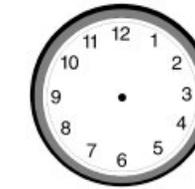


Twirling with Time Spinner



Twirling With Time

Write the time that you and your partner spun in the time column. Then, draw the hour hand in pencil and the minute hand in another color on the clock. Lastly, write the word name using the words **to** or **after**.

Time	Clock	Word Name using to or after
12:15		Fifteen (15) minutes after twelve (12)
		
		
		
		
		

Telling Time Assessment

1. Draw the hands on the clock to show 8:20.



2. Write another way to say that it is 8:20. _____

3. What time does the clock show?

- a. 1:39
- b. 1:48
- c. 9:08
- d. 10:10



4. Look at the clock. Frank says that it is 8:55. Denny says that it is 7:55. Who is correct? Use what you know about telling time in order to explain your answer.



Telling Time Assessment Key

5. Draw the hands on the clock to show 8:20.



6. Write another way to say that it is 8:20. twenty after eight
or 20 after 8

7. What time does the clock show?

- a. 1:39
- b. 1:48
- c. 9:08
- d. 10:10



8. Look at the clock. Frank says that it is 8:55.
 Denny says that it is 7:55. Who is correct? Use
 math vocabulary in your explanation.



Denny is correct because it is only 5 minutes to eight o'clock. I know that as the minute hand moves around the clock, the hour hand moves with it, closer to the next hour. The hour hand is not past the eight, so it can't be 8:55.

Defining ELAPSED TIME

Prediction: I think **elapsed time** is

Examples:

Review your **prediction** and provide notes and/or a diagram in the space below.

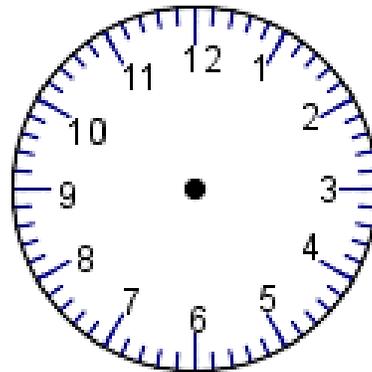
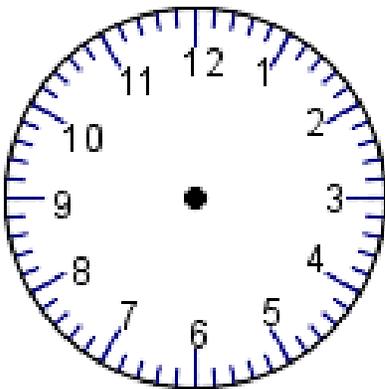
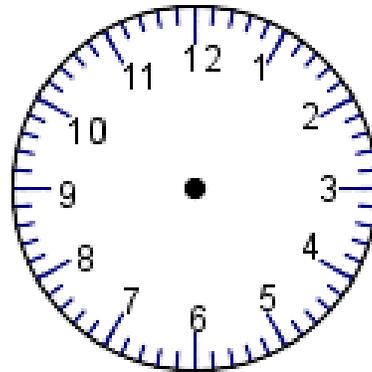
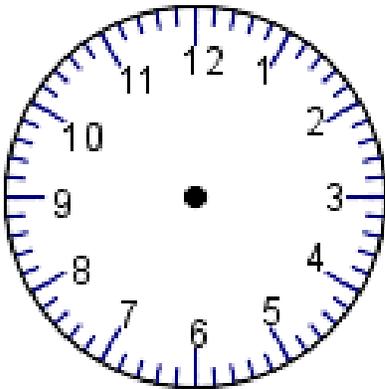
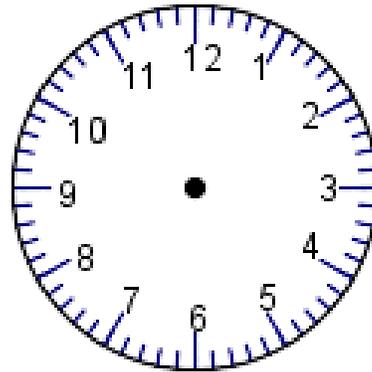
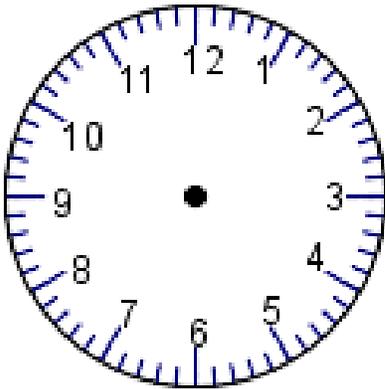
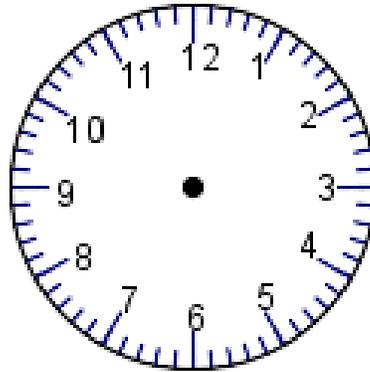
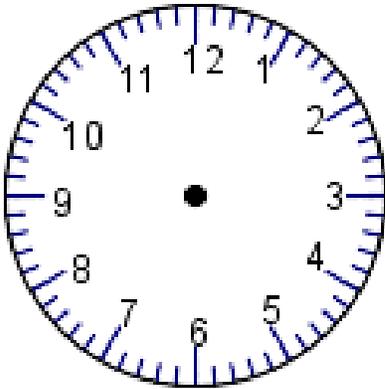
Now I think **elapsed time** is

A Resource helped me to define **elapsed time** as:

Highlight key words in each definition and create an **ICON** that will help you remember what these words mean.



Shooting For Time



Teacher Observational Checklist

Criteria	Names of Students																			
Demonstrates understanding of estimating time																				
Correct placement of hour hand																				
Correct placement of minute hand																				
Demonstrates understanding of elapsed time giving:																				
End Time																				
Elapsed Time																				
Start Time																				
Writes time in (2) ways:																				
Words																				
Numbers																				

Teacher Notes / Anecdotal Records

Elapsed Time: Reading a Schedule

Program	Starts	Ends	Elapsed Time
Scooby Doo	7:30 pm		30 min.
Sponge Bob	9:00 am	9:55 am	
Animal Planet		3:00 pm	30 min.
Sea Adventures	8:00 pm		45 min.

Elapsed Time: Reading a Schedule

Program	Starts	Ends	Elapsed Time
Scooby Doo	7:30 pm		30 min.
Sponge Bob	9:00 am	9:55 am	
Animal Planet		3:00 pm	30 min.
Sea Adventures	8:00 pm		45 min.

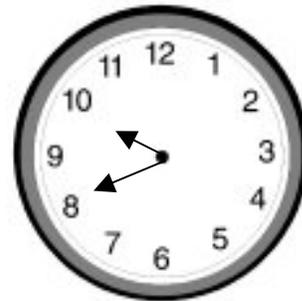
Summative Assessment

Write seconds, minutes, hours, days, weeks, months, or years to complete the sentences.

1. Physical Education class is about 45 _____ long.
2. Winter lasts about 3 _____.
3. Draw the hour and minute hand to show **10:25**.



4. What time does the clock show?
 - a. 5:18
 - b. 8:50
 - c. 9:40
 - d. 10:40



5. Complete the table.

Program	Starts	Ends	Elapsed Time
Dora the Explorer	7:00	7:30	
Cat Dog	12:15		45 minutes

Brief Constructed Response

Part A

Which estimate of time is more reasonable for playing a game of checkers?

Circle your answer: 30 minutes 30 hours

Part B

Use what you know about estimating time to explain why your answer is correct. Use numbers and/or words in your explanation.

Summative Assessment Answer Key

Write seconds, minutes, hours, days, weeks, months, or years to complete the sentences.

6. Physical Education class is about 45 **minutes** long.

7. Winter lasts about 3 months.

8. Draw the hour and minute hand to show **10:25**.



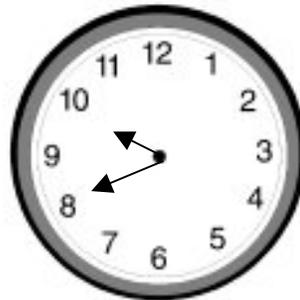
9. What time does the clock show?

a. 5:18

b. 8:50

c. 9:40

d. 10:40



10. Complete the table.

Program	Starts	Ends	Elapsed Time
Dora the Explorer	7:00	7:30	30 minutes
Cat Dog	12:15	1:00	45 minutes

Brief Constructed Response

Part A

Which estimate of time is more reasonable for playing a game of checkers?

Circle your answer:

30 minutes

30 hours

Part B

Use what you know about estimating time to explain why your answer is correct. Use numbers and/or words in your explanation.

30 minutes is more reasonable because recess is 30 minutes and we usually finish a game of checkers during recess. 30 hours is longer than 1 day, so it doesn't make sense to play checkers for that long.