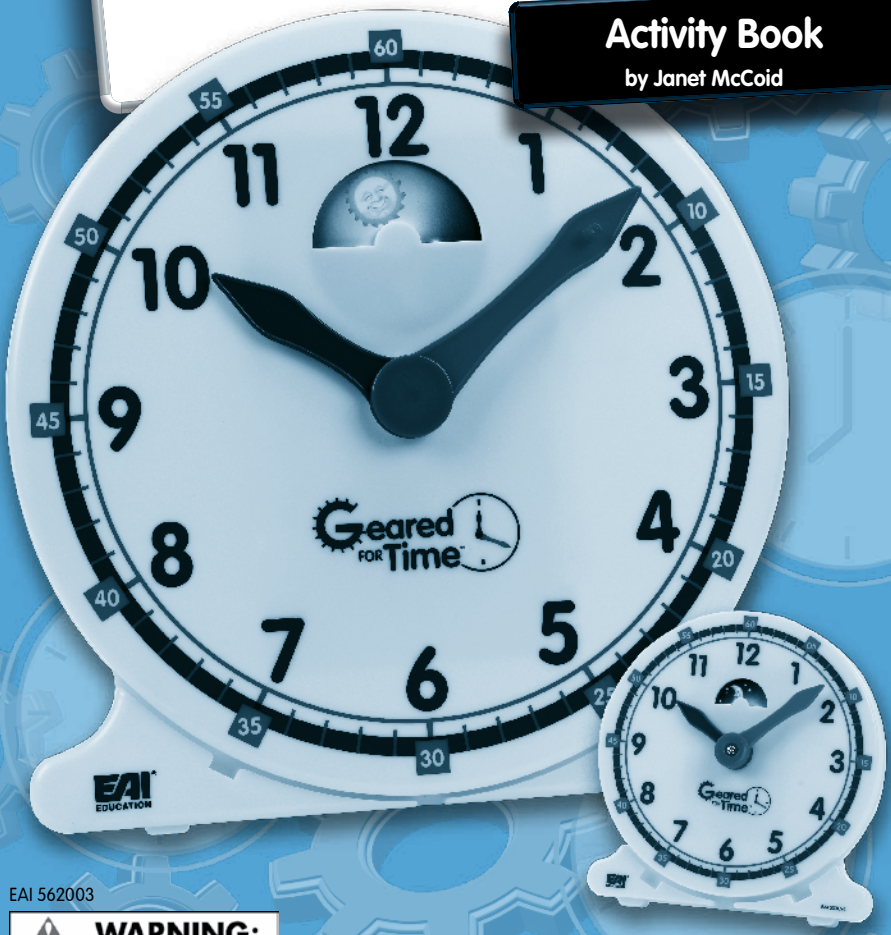
EAI EDUCATION

Grades K-5

Geared FOR Time® Clock

Activity Book

by Janet McCoid



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WARNING:
CHOKING HAZARD - SMALL PARTS.
NOT FOR CHILDREN UNDER 3 YRS.

Acknowledgements:
Janet McCoid is a Math Coach, and National Board Certified Teacher (NBCT).

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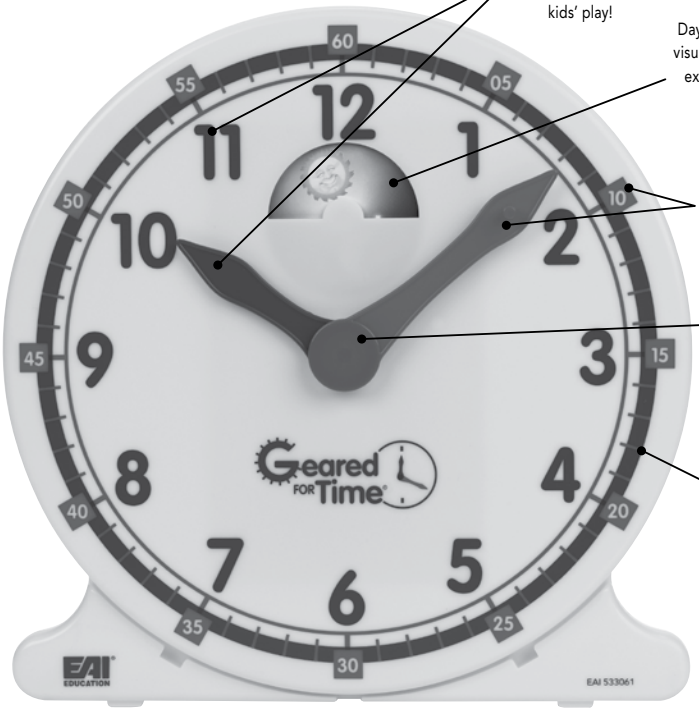
Meet the... Geared for Time® Clock



What is a Geared for Time® clock?

The Geared for Time® clock is a device that can be used for teaching the concept of time at all grade levels.

How does it work?

As the minute hand is moved around the clock face, the hour hand automatically moves in relation to the minute hand. These actions model the movements of a real clock.

How can I use my clock in the classroom?

After reading though this booklet, you will see there are a number of fun and creative ways the Geared for Time® clock can be easily incorporated into your lessons and used throughout the course of the school day.

Reproducible guides on pages 11–22 correspond to the activities in this booklet and can be used as blackline masters or with our SmartPAL® transparent sleeve.

Getting to Know You - Learning the Vocabulary

Fostering vocabulary growth will heighten classroom discussion and strengthen mathematical understanding. Here are a few ways to help make math vocabulary learning fun and exciting!

- Copy and cut out the vocabulary cards to use on your math word wall.

- Create a matching game using the vocabulary cards. Photocopy the illustrations found on pages 12-17 on white paper and the matching definitions on colored paper. Laminate individual cards for extra durability. The cards are then cut apart, shuffled, and placed faced down in a grid format on the table. Players take turns flipping over one white card and one colored card. The vocabulary words and definitions are then read by the player who flipped the cards. If there is a match, the player places the set of cards in his or her pile, and takes another turn. If there is no match, the cards are returned to the face-down postion and the next player takes a turn. When all of the vocabulary cards have been matched, the player with the most matches is the winner!

- Copy and cut apart the vocabulary cards. Place the cards in a pile face down. Player one chooses the top card in the pile and describes the word he or she has chosen from the card pile. Player two determines which word is being described. Example: Stopwatch. "A tool used to see how long it takes someone to do something… I have seen it used when people are running a race… It is usually small in size but can move very fast."

Guess My Time

Describe a time being made on the demonstration clock. Example: "My clock has the hour hand on the four and the minute hand on the twelve." Before showing the time, have each student make the matching time on his or her clock according to the given description. On the count of three, ask all students to hold up their clocks for a quick formative assessment. Hold up the demonstration clock for the class to see. Ask the students to check and see if their clocks match the demonstration clock. If not, take a minute to allow students to move the hands to match the demonstration clock and re-adjust their thinking.

Continue the activity and have the class practice setting the clock for different times. Call out times such as 8:30, 4:00, etc. Make the activity more challenging by using vocabulary words and phrases like "noon", "midnight", "quarter-to ____", etc.

Extension Ideas

Ask students to name the time you are describing on the clock. Example: "My clock shows the minute hand on the twelve and the hour hand on the 6. What time is it?" Once several students have responded, show the class the time described by revealing your clock.

An advanced version may use elapsed time. Example: "My clock shows 7:00 P.M. What time will it be in an hour and a half?" Allow students to take turns playing "Teacher", creating different times for classmates to make on their clocks.

The Human Clock

Choose one student to play Timekeeper. Build a huge human clock by assigning twelve students to hold large posters of the numbers found on a clock face, two students to hold a meter stick (minute hand), and one student to hold a ruler (hour hand). The Timekeeper calls out a time and makes it on his or her Geared for Time® clock. Without seeing the Timekeeper's clock, the human clock has to work together to create the called time so that it matches the Timekeeper's clock. Students who are not a part of the human clock may be in charge of arranging the human clock or may use their student Geared for Time® clocks to show the time called by the Timekeeper. Children switch roles every so often.

Race Against the Clock

Divide the class into teams of four or five students and hand each group a Geared for Time® clock. The teacher then calls out a time, and students show the time on their clock. The first team to show correct time gets a point.

Extension Idea

Hand each student on the team a Geared for Time® clock to race with.

Linear Time

This is a great activity to discuss and reinforce A.M. and P.M. Have students pay careful attention to the sun and moon placement on their clocks throughout the activity.

Line up the student clocks along a chalkboard ledge or at the front of the room. Set a time for the first clock. Working in small groups, students adjust the clock hands of the succeeding clocks to show the progression of time by the hour. (Example: The first clock is set for 8:00 A.M. The remaining clocks should be set at 9:00 A.M., 10:00 A.M., 11:00 A.M., 12:00 P.M., 1:00 P.M., 2:00 P.M., 3:00 P.M., and so on.) Make sure the day/night indicator displays the correct time of day. Vary the lesson by changing the beginning or ending times. For example: 7:30 P.M., 1:15 A.M., 3:25 P.M., etc.

Extension Idea

Make the lesson more challenging and reinforce the concept of the minute hand by having students show the progression of time by 5, 10, 15, 30, or 45 minutes.

Once students are familiar with linear time, pass out slips of paper with a given time using A.M. or P.M. to each student. Have each student make the time on his or her Geared for Time® clock. Set a time of your choosing on the demonstration clock. When everyone is done, say and show the demonstration clock time and have the class arrange themselves in chronological order at the front of the room beginning with your given time. Ask students to double check themselves and make any adjustments if needed. Collect the slips of paper and repeat the activity, giving each student a new time. Make the activity more challenging by writing out the time in words and/or having the same time for both A.M. and P.M. (Example: twenty-past ten at night, and 10:20 A.M.)

Divide the class into small teams with an even number of players on each team (one student may take two turns if there is an odd number). Have each team form a line similar to a relay race. When the teacher calls out a time, the first student in line runs to their team's clock and makes the time on that clock. The player then runs back to the line and tags the next player in line. The next player runs to the clock and shows an hour later (alternate time changes of minutes or hours can be used for varied play). Each player has a chance to run to the clock and show one hour later than the time displayed on the clock. When the last player has completed their turn and is back in line with their team, the teacher checks the clock to see that the final time is correct. Different versions of this can be created by substituting running for crab walking, hopping, skipping, taking giant steps, scooter racing, jump roping, or galloping. The times can be adjusted to make this activity easier or more challenging.

Estimate! What can you do in a minute?

Help students build an internal sense of time. Have each student count the number of times they can clap, flip a coin, jump, write their names, etc. for one minute straight. Without changing the task, repeat the experiment with different segments of time (1 second, 30 seconds, 3 minutes, 5 minutes, etc.). Review additional tasks that may take an hour or a second, and discuss how knowledge of time length may be useful.

Timepieces

Brainstorm a list of different timepieces (clock, stopwatch, hourglass). Discuss how each timepiece operates and what type of energy is required to make it run. Set up a learning center in the classroom. Include stopwatches, analog clocks, digital clocks, sand timers, egg timers, and wristwatches. Students can experiment with and compare the different tools used to measure time. Create a Venn diagram to compare timpieces (see pages 18 and 19 for guides).

Extension Idea

Ask students to inventory the number of timepieces found at home and record the results (a recording sheet can be found on page 22). Create a class graph indicating how many different timepieces were found. Use the chart for additional data analysis.

Time Sort

Photocopy and cut out the sorting cards on page 21. Using the Time Sort! chart provided on page 20, have students determine the best time-measurement tool to use for each scenario by sorting the cards into the appropriate columns.

Storytime

Share an illustration from a book. Ask students to determine what time of day they think it is in the story. Discuss the clues used to determine a time of day. Then, using the guide on page 11, have students draw the corresponding time on clock. Next, record the picture or story clues used to make the determination.

School Time

Discuss activities typically done during a school day. Write a list of ideas on the board. At what time does each activity occur? As students determine each start time, have them show that time on their clocks. Ask students, "How long would that particular activity take?" and have them show the end time on their clocks. (Example: If art class begins at 9:30 A.M., and is 30 minutes long, at what time will art class be over?) Repeat the activity including happenings that occur before and after school, on weekends, and during holidays.

Charades

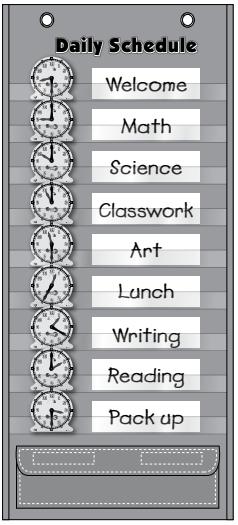
Play charades using the activities listed on the board. Ask students to use their clocks to indicate when they think the activity is occurring. Play an alternate version of the game by giving each student a card with a specific time on it. The student has to act out an activity that would typically occur at the time on the card. Example: 9:00 P.M. can be acted out with going to bed.

Race the Clock

One child is the Timekeeper and stands a good distance away from the other children (about 15 feet). The remaining students line up in a row facing the Timekeeper (this is the start line). The children yell, "What time is it, Timekeeper?" The Timekeeper holds up the clock showing the time they have chosen (4:00, 7:00, etc.) and calls it out. Using the number of hours, the children take exactly that many steps (big or small) toward the Timekeeper. When the Timekeeper yells, "Time's up!", all students are chased back to the start line by the Timekeeper. Whomever the Timekeeper tags first becomes the next Timekeeper and play resumes.

Daily Schedule with Clocks

Use clocks in conjunction with your daily schedule to provide structure and time sense to students' school day. Mini clocks or paper clock faces can be used in a pocket chart to show the time each activity will occur.



- When lining up for lunch, show the current time on the clock and ask, "At what time is lunch over?" Then, turn the hands to show the time the lunch period ends.

- If there is a special program or assembly, show the time of the event on the clock. The clock can be left on the ledge of the chalkboard or teacher's desk so students can refer to it throughout the day.

- When assigning classwork, provide a starting and ending time for the assignment. Discuss where the hands of the clock are located to demonstrate the current time, and then move the hands on the clock to demonstrate what the time will be at the conclusion of the assignment.

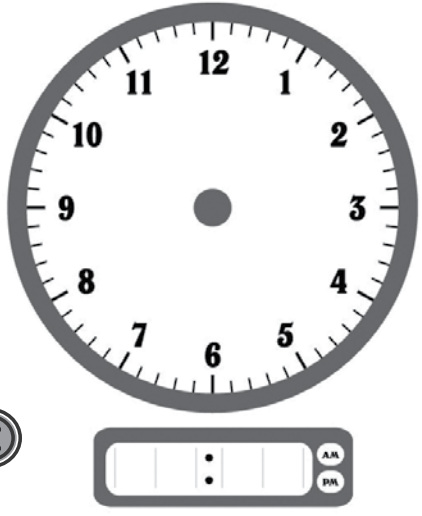
Think, Pair, Share

The teacher gives a word problem. Each student moves his or her clock hands to show the answer. Then, with a partner, they discuss their answers and explain how they figured it out. Call upon the several student pairs to share and compare their strategies with the class.

Example problem: If my dog Oscar began to eat a bone at 1:00 P.M., and it took him an hour and a half to eat it, at what time did he finish?

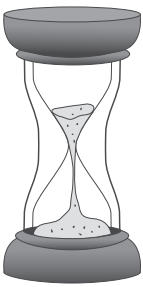
History and Time

Research and discuss the history of timepieces and clocks. Create a poster, time line, or newspaper article to report your findings.



11

Vocabulary Cards 1 (Front)



Vocabulary Cards 1 (Back)

Analog Clock
Measures the time indicating hours, minutes, and seconds by the position of hands on a round dial.

Alarm Clock
A clock with a bell or buzzer that can be set to sound at a particular time.

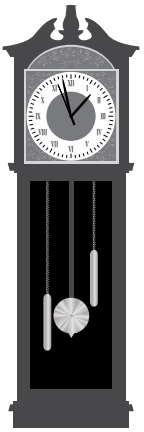
Digital Clock
Displays the time electronically using numbers such as 8:25.

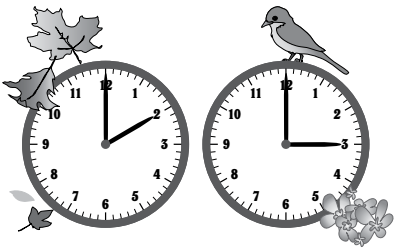
Watch
A small portable timepiece designed to be worn (as on the wrist) or carried in the pocket.

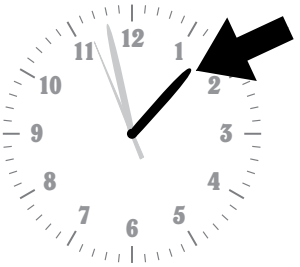
Hourglass
An instrument for measuring time in which sand runs from the upper part to the lower part of a glass container in one hour. Also known as sandglass or sand timer; measures set amount of time that is not one hour.

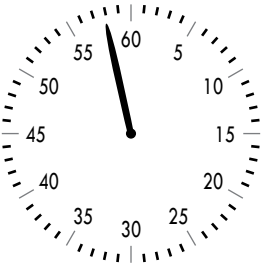
Stopwatch
A special watch that can be started and stopped by pushing a button for exact measurement of time, used to time races.

Vocabulary Cards 2 (Front)









Vocabulary Cards 2 (Back)

Grandfather Clock
A weight-driven pendulum clock, enclosed in a tall, free-standing, narrow case.

Daylight Saving Time
(DST) Time during which clocks are typically set one hour ahead of standard local time to provide more daylight at the end of the day during late spring, summer, and early fall.

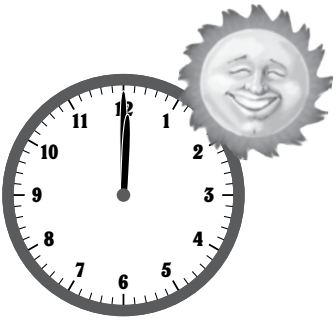
Hour Hand
The short hand on an analog clock or watch that moves completely around the clock twice a day and indicates hours.

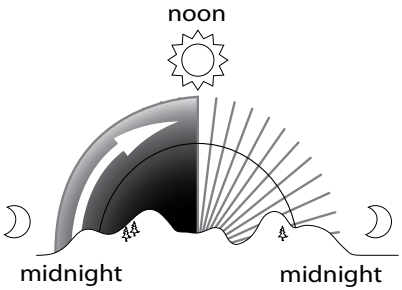
Minute Hand
The long hand on an analog clock or watch that moves around the clock once every hour and indicates minutes.

Second Hand
The hand on an analog clock or watch that moves around the clock once every minute and indicates the seconds.

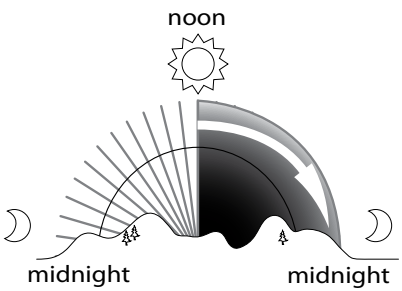
Minute
A unit of time equal to 1⁄60 of an hour or 60 seconds.

Vocabulary Cards 3 (Front)

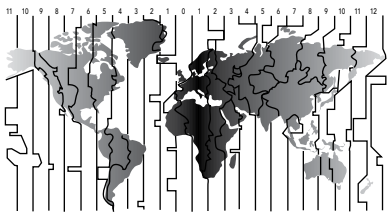




midnight to noon



noon to midnight



Vocabulary Cards 3 (Back)

Noon
Twelve o'clock in the daytime or mid-day. 12:00 P.M.

Midnight
Twelve o'clock in the middle of the night. 12:00 A.M.

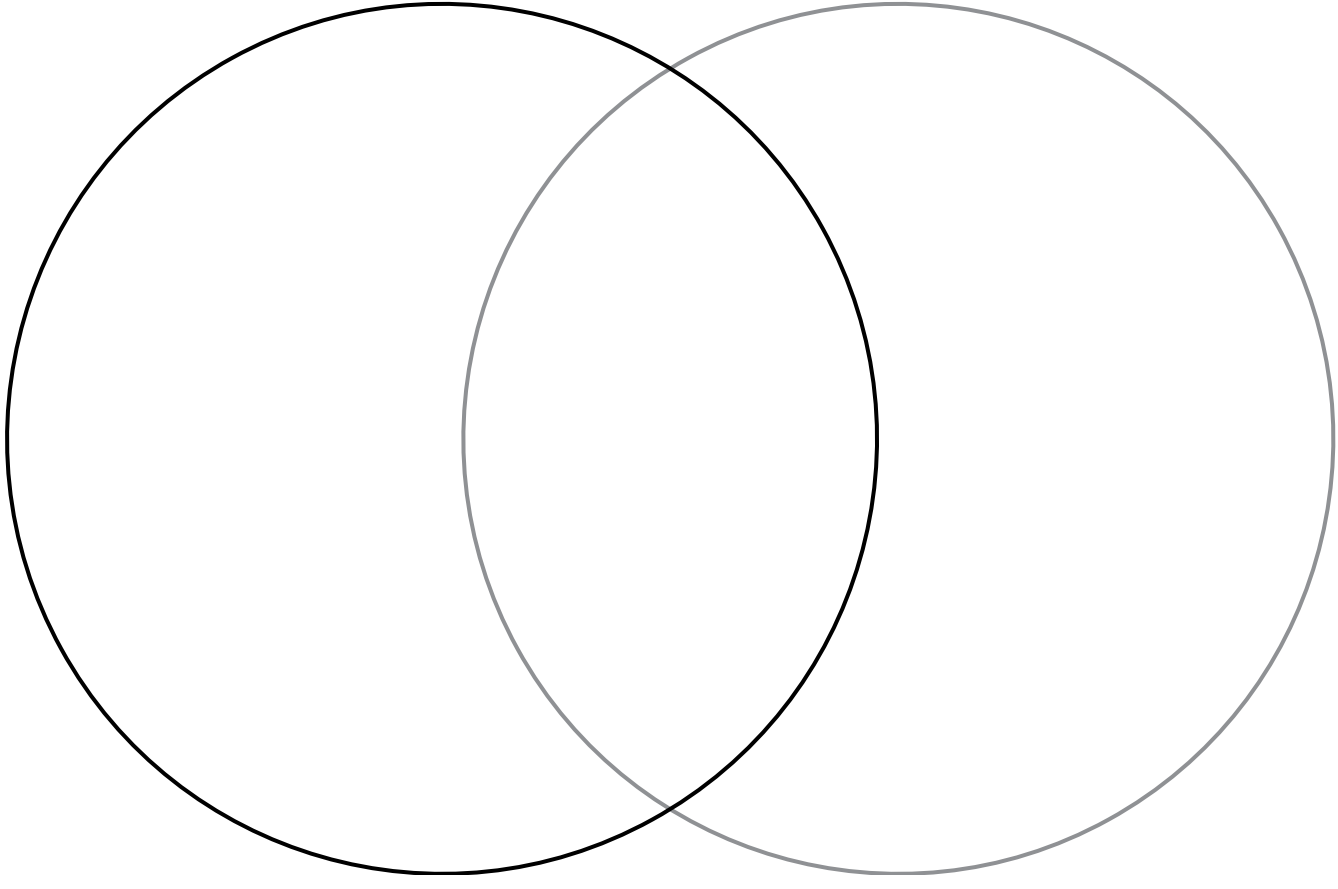
A.M.
Stands for *ante meridiem*, a Latin phrase meaning "before noon". Used to specify the time of day.

P.M.
Stands for *post meridiem*, a Latin phrase meaning "after noon". Used to specify the time of day.

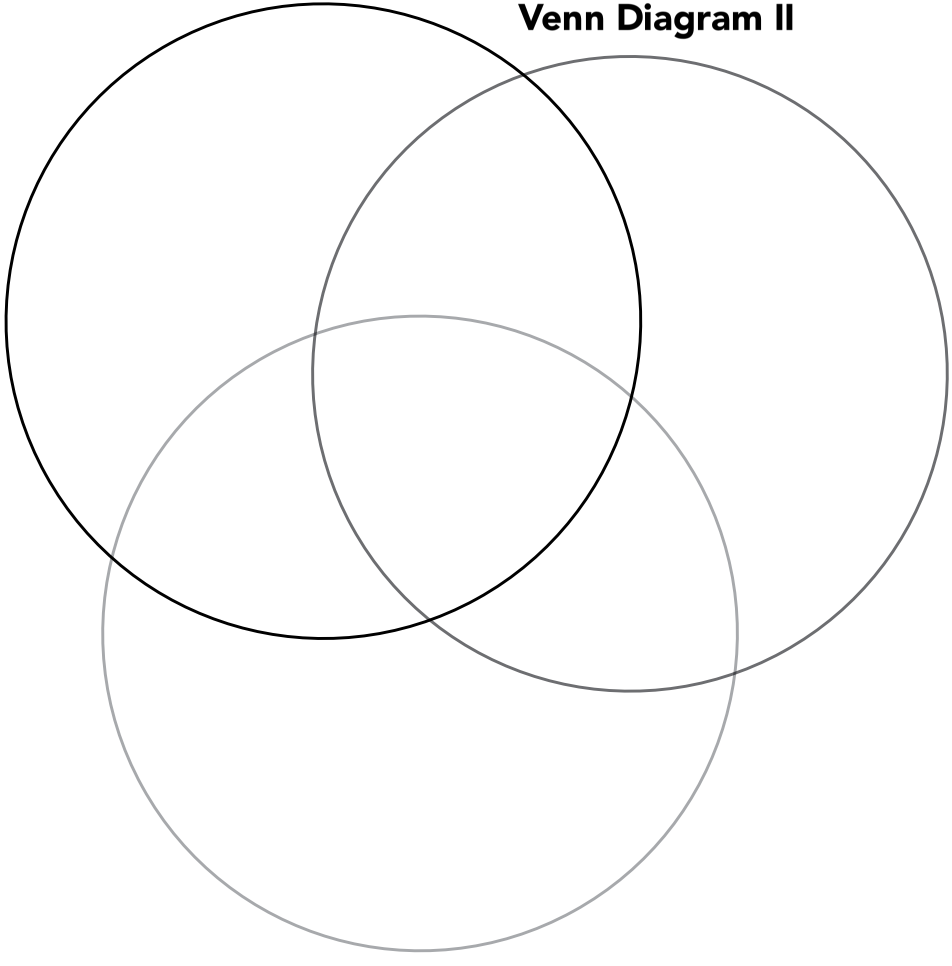
Time Zone
Any of the 24 longitudinal divisions of Earth's surface in which a standard time is kept. Each zone observes a clock time one hour earlier than the zone immediately to the east.

Sundial
A device to show the time of day, used before the invention of the modern clock. A central needle sticks out of the center of the clock and casts a shadow. As the sun moves across the sky, the shadow moves too, showing different times.

Venn Diagram I

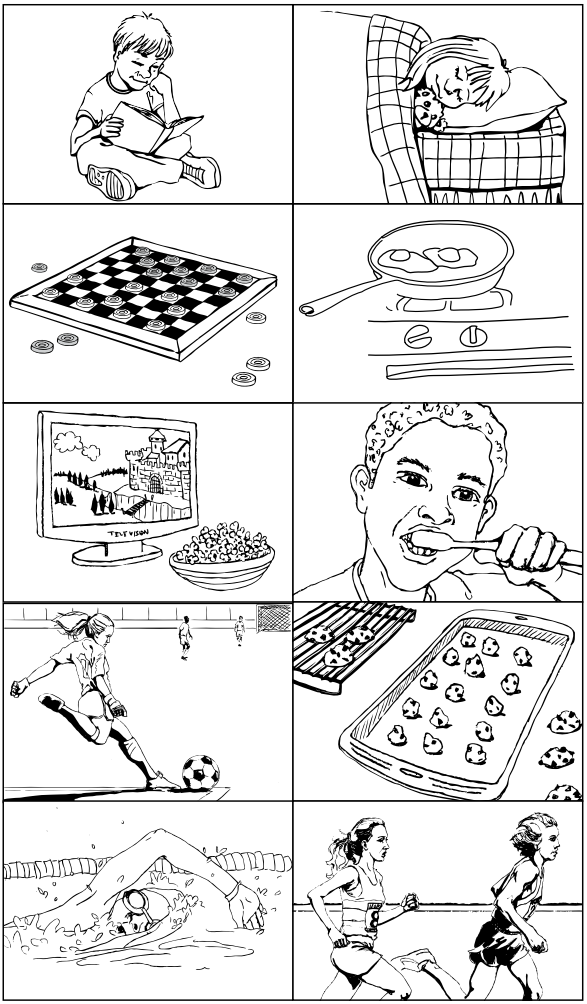


Venn Diagram II



Time Sort Chart

Time Sort Cards



Timepiece Record Sheet

Type of Time Piece	Number Found	Energy Type

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