Parking Time

An exercise to demonstrate changes in the Earth through time, and the length of time it took for those changes to happen. In this case, using a parking lot.

Materials

- A parking lot (For safety reasons use a part of a lot that has no traffic)
- Tape measure
- Paper, colored pencils or crayons, or other materials to draw or make costumes or posters of ancient animals and plants (can be done at home or in class prior to the activity)

Activity

Constructing time lines is a common method for demonstrating changes in Earth history. But these demonstrations don't have to be limited to lengths of adding machine paper. You can get across the same principles in a parking lot. In fact, the concept of the expanse of time between events can sometimes be better shown in a parking lot than a classroom because there is more room. Of course, its also more fun to be outside than in the classroom. Rather than drawing objects or moments of time on a piece of paper, the students can be active members of the time lines themselves.

Before bringing the students out to the parking lot, pick the events you want your class to use from the list of Important dates in Earth history, or have the students pick a creature or event. The teacher can calculate the distance for each key event, or have the students calculate the distance in class, or as part of a homework assignment prior to the activity. As with the time lines on paper, you have to decide how much time you want to demonstrate in the parking lot. There are two ways to do this depending on what you want the students to understand: (1) all of geologic time, or (2) that part of geologic time in which there has been abundant life. The advantage of showing all of geologic time is that most of the students will be clustered toward one end of the court, and they can see how far away the student representing the beginning of the Earth is standing. This is an excellent way to show how long it took these life forms to develop. If you would rather stress how long it took the more familiar life forms to develop, or to better show species change through time, use only the last 542 million years of Earth history, since the beginning of the Paleozoic Era (Phanerozoic Eon).

Times and distances for both the 4.6 billion year time parking lot and 542 million year time parking lots are provided below. If you want to demonstrate how the change in scale influences perception of time or ability to see changes try both; first with the parking lot representing all of geologic time, and then second with the parking lot representing just the Paleozoic era to the present.

To make the time parking lot more exciting for the students, assign each a key date in Earth history a day or two before going to the gym. Let each student go to the library or provide information about the key date so that they can make a mask, poster, or write a short limerick about their key event. For example, if a student was assigned blue-green algae, they might say "I'm blue-green algae, not much more than slime, but I ruled the Earth for a very long time!" For a mask they might make a headdress that looked like sea weed, or drape themselves in green streamers. This will let each student use their own creativity to illustrate the concept of changes in time.

Prior to Activity:

Measure your parking lot or the distance between parking spaces with a tape measure. There is considerable variability in the size of parking lots and even parking spaces. Most parking spaces are 8.5 to 9 ft apart. If you

can pick a spot in the parking lot that has a large number of spaces you can use the lines dividing spaces similar to the lines on a football field. The lines will be like a giant ruler the students can use to position themselves in time. The more spaces and greater the distance, the better the activity will work.

Calculations:

To determine the distance between time periods or key events in the parking lot (or to have the students make the calculation) determine if you want to show all of geologic time, or just the time of abundant life (Paleozoic Era to present) and divide by the length of the parking lot or the number of spaces.

(1) For 10 parking spaces, all of geologic time would be calculated as:

4,600,000,000 years / 10 spaces=460 million yrs/space

(1a) For a 9 foot-wide parking space, 460 my / 9 ft = 51 million years/foot, or 1 inch= 4.2 million years

(If you have different width parking spaces substitute that width for the 9 in the equation)

At this scale, the Paleozoic era begins between the first and second parking space, and most of the ancient creatures that students are aware of will be within the first space. The beginning of the earth is at the end of the tenth space. To calculate the position of a creature or event in the parking lot at this scale (or to have student calculate the position), get its age from Important dates in Earth history then use the following calculation:

(1b) To calculate in feet: Date you wish to show in million years / 51 million years/foot= distance from beginning of parking lot (representing today) in **decimal feet** .

For example, Tyrannosaurus rex lived 75 million years ago, so: 75 my/ 51 my/ft = would be 1.47 feet from the beginning of the parking space.

(1c) To calculate in inches: (Date you wish to show in million years / 51) * 12 inches/ft= distance from beginning of parking lot (representing today) **in inches.**

For example, Tyrannosaurus rex lived 75 million years ago, so: (75 my/ 51 my/ft) 12 in/ft = would be17.6 inches from the beginning of the parking lot*

(2) For 10 parking spaces, if you only wanted to show that part of geologic time in which there was abundant life (beginning of the Paleozoic Era and Phanerozoic Eon), then calculate:

542,000,000 years / 10 spaces = 54.20 million years / space

(2a) For a 9 foot-wide parking space, 542 my / 9 ft = 6.02 million years/foot, or 1 inch= 501,852 years

(If you have different width parking spaces substitute that width for the 9 in the equation)

At this scale, the Paleozoic era begins at one end of the parking lot and you can better demonstrate the change of creatures from the beginning of the Paleozoic Era to the present because they will be spread out across 10 spaces (or however many you have in your lot).

(2b) To calculate the position of a creature or event on the parking lot in feet for just the Phanerozoic time (Paleozoic Era to present), get its age from Important dates in Earth history then use the following

calculation: Date you wish to show in million years / 6.02 my/ft = distance from one side of the parking lot (representing today) in **decimal feet** .

For example, Tyrannosaurus rex lived 75 million years ago, so: 75 my/ 6.02 my/ft = would be 12.46 ft from one side of the parking lot. If the parking lot lines are 9 feet apart (from the center of the painted stripe) than the position is ~3.5 ft past the first parking space

(2c) To calculate in inches: (Date you wish to show in million years / 6.02 my/ft) * 12 inches/ft= distance from one side of the parking lot (representing today) **in inches.**

For example, Tyrannosaurus rex lived 75 million years ago, so: (75 my/ 6.02 my/ft) 12 in/ft = would be149.50 inches from the end of the parking. If the parking lot lines are 9 feet (108 inches) apart (from the center of the painted stripe) than the position is 149.5-108 = 41.5 inches past the first parking space*

In the Parking Lot:

Using a tape measure and the calculated time/position of the student's creature or event, have your students move to their calculated position in the parking lot. You can speed up the activity by using tape to mark off time or geologic periods the night before and having the students go to a relative position rather than measuring with a tape measure. Tell them to keep their position and not to move. Let all of the students see each other's creature or event. Relate to the students the positions in the lot so they can see the distance between creatures or events and better relate to the expanse of time and earth history.

If you use the “all of geologic time” scale, students will get very bunched up in that first parking lot. You might point out that the lengths of their shoes are several million years. Which can be fun, but is harder to keep the students in place.