How Big Is It?

Investigating size and scale using the metric system.

Try this!

1. Arrange the scale cards in a line across the top of your table, from smallest to biggest.

2. Make a second row of object cards, placing the object card next to the scale card that **best** fits the measurement of the object.

CA Science Content Standards

Grade 2, Standard 4b – express measurements in metric system units
Grade 4, Standard 6b – estimate the length of objects

Materials

- Set of scale cards
- Set of object cards

Notes to the presenter

You can do this activity with different sets of object cards. The first page of object cards includes more commonly known objects. The second page includes additional, more challenging objects. You can also select objects that are relevant to the scale your students are learning about (larger than one meter, smaller than 1 meter, microscopic objects, etc.)

See also this interactive comparison of objects smaller than 1 mm: www.cellsalive.com/howbig.htm

See also this comparison of cells, viruses, and biological molecules:
http://learn.genetics.utah.edu/content/begin/cells/scale/

Extensions

These cards can be used for a variety of other activities. Some teachers have combined several sets to make a deck of cards, and used the deck to play "poker". They can also be used in a Pokemon-like trading game where larger (or smaller) objects are more "powerful".

Credits
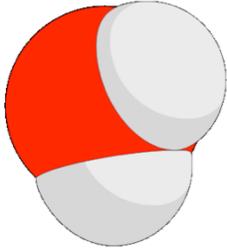
Image Sources

Water molecule: http://kinialohaguy.files.wordpress.com/2009/05/water_molecule.png
Carbon nanotube: http://www.ewels.info/img/science/nanotubes/tube.angled.jpg
Virus: http://www.drugdevelopment-technology.com/projects/fludase/images/1-influenza.jpg
Candle: http://www.clker.com/clipart-10942.html
Bacterium: http://www.ou.edu/class/pheidole/General%20Bacteria.jpg
Red blood cells: http://health-pictures.com/blood/images/red-blood-cell.gif&imgrefurl=http://health-pictures.com/blood/red-blood-cell.htm
Human hair: http://commons.wikimedia.org/wiki/File:Human_hair_SEM.svg
Penny: www.faqs.org/photo-dict/ phrase/749/penny.html
Quarter: http://www.hung-truong.com/blog/wp-content/uploads/2007/10/quarter.jpg
Envelope: http://www.clker.com/cliparts/e/3/4/7/11949844071868980516addressed_envelope_with_stamp_01.svg.hi.png
5-year-old child: http://www.dallasnews.com/sharedcontent/dws/img/v3/09-23-2007.NTR_0923Dora.GJD27VKDF.1.jpg
Bus: http://www.athenstransit.com/our-services/the-bus.html
Soccer player: http://www.outdoorfunstore.com/sports/IMAGES/Soccer1.JPG
"Walking Away": http://www.laurennassef.com/wp-content/uploads/walking-away.gif
Airplane: http://www.dennisholmesdesigns.com/siteimages/airplane.png
Interstate sign: commons.wikimedia.org/ wiki/File:I-25_(big).svg
Cesium atom: http://www.saburchill.com/chemistry/visual/atoms/055.html
DNA double helix: http://www.ec.gc.ca/EnviroZine/images/DNA.jpg
ATP molecule: http://www3.ntu.edu.sg/home/CXGuo/Energy%20Harnessing_files/main_files/image001.jpg
Transistor symbol: http://www.freeclipartnow.com/d/40997-2/IEC-NPN-Transistor-Symbol.jpg
DVD: http://upload.wikimedia.org/wikipedia/commons/thumb/3/30/DVD.png/250px-DVD.png
Merino sheep: www.pelage.co.nz/ fibres.htm
Dust mite: http://upload.wikimedia.org/wikipedia/commons/thumb/e/eb/House_Dust_Mite.jpg/250px-House_Dust_Mite.jpg
Amoeba: http://www.arthursclipart.org/biologya/biology/amoeba%25202.gif
Wedding ring: http://goldprice.org/gold-jewellery/uploaded_images/gold-wedding-ring-780063.jpg
Electrical outlet:
http://www.homefurnish.com/CMS400Min_dev/uploadedImages/homeimprovement/electrical/iStock_000001058487Small_175.jpg
Basketball player: http://www.shutterstock.com/s/_basketball_player_vector/search.html
House: http://www.fotosearch.com/bthumb/ART/ART194/SUB055.jpg
Train: http://files.songbirdnest.com/wp-content/uploads/2008/03/caltrain.png
Empire State Building: http://www.newyorkminiaturemodel.com/Buildings/images/Empire%20State%20building_jpg.jpg
Mt. Everest: http://ghoomghaam.com/images-articles/mountain-everest.jpg
Outer space cartoon: http://comps.fotosearch.com/comp/IMZ/IMZ001/outer-space-b_~ski0050.jpg

Permissions

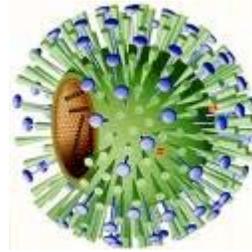You are free to copy, distribute, transmit or remix this work as long as you credit the work as specified under cc-Attribution (http://creativecommons.org/licenses/by/3.0/).

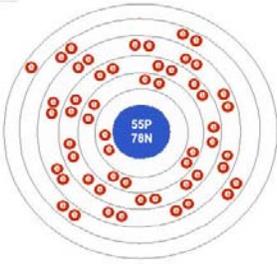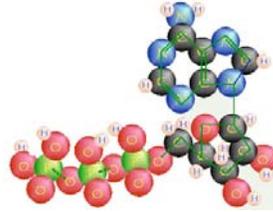| width of a water molecule	diameter of a carbon nanotube	diameter of a flu virus	wavelength of visible light
width of a bacterium	diameter of a red blood cell	thickness of a human hair	thickness of a penny
diameter of a quarter	width of a standard envelope	height of a typical 5-year-old child	length of a standard city bus
length of a soccer field	distance walked in 20 minutes	cruising altitude of an airplane	distance a car can travel on a freeway in 1 hour
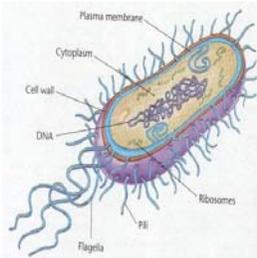
diameter of a cesium atom	diameter of a DNA double helix	length of an ATP molecule	width of a transistor in a computer chip
width of a single bit on a DVD	diameter of a strand of Merino wool	length of a dust mite	length of a typical amoeba
width of a wedding ring	width of an electrical outlet cover	height of a typical pro basketball player	height of a 2-story house
length of a 5-car train	3x the height of the Empire State Building	height of Mt. Everest	altitude of official start of "outer space"

10^{-10} m (1 angstrom)	10^{-9} m (1 nanometer)	10^{-8} m (10 nanometers)	10^{-7} m (100 nanometers)
10^{-6} m (1 micrometer)	10^{-5} m (10 micrometers)	10^{-4} m (100 micrometers)	10^{-3} m (1 millimeter)
10^{-2} m (1 centimeter)	10^{-1} m (1 decimeter)	10^{0} m (1 meter)	10^{1} m (10 meters)
10^{2} m (100 meters)	10^{3} m (1 kilometer)	10^{4} m (10 kilometers)	10^{5} m (100 kilometers)