

Sundial

All Ages

Creating a sundial is a fun way to discover how to tell time by the position of the sun and to explore the effects of the Earth's rotation around the sun.

The most common sundial is a flat surface with a central stick or triangle set at a right angle to the flat surface. This "shadow stick" is called a gnomon. The flat surface is marked, usually with lines, to show the hours of the day. As the earth rotates, the sun appears to move slowly across the sky. As it does, the shadow cast by the gnomon aligns with the different hour-lines or markers.



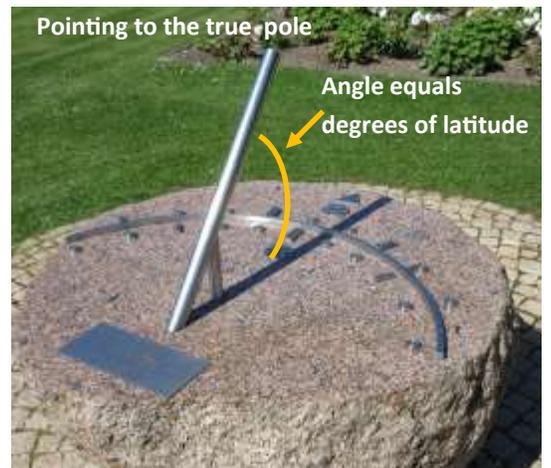
To make a simple sundial, head out to a sunny, flat, paved surface with your sidewalk chalk. Mark a central spot and have your child stand there as the gnomon. Mark the top of your child's shadow (use different colour chalk for each child) and note the time. Repeat this each hour.



Spending a day at the beach? Mark the time with a sundial. Stand a stick in the sand and mark the hours with pebbles, shells or sand drawings. Sundials are not just for summer. Use a snowball, snowman or an icicle as a gnomon.



To make a more accurate sundial, the gnomon needs to align with the axis of the Earth's rotation. Sounds challenging, but this simply means the tip or highest point of the gnomon must point to True (geographical) North and not the magnetic pole. A GPS or compass app will give you true north. The gnomon will also need to be set on an angle from the flat surface. The angle is the same as your geographical latitude. For example, if you are at 44 degrees from the equator your gnomon will be positioned at 44 degrees. You can find your latitude with the same GPS or compass app.



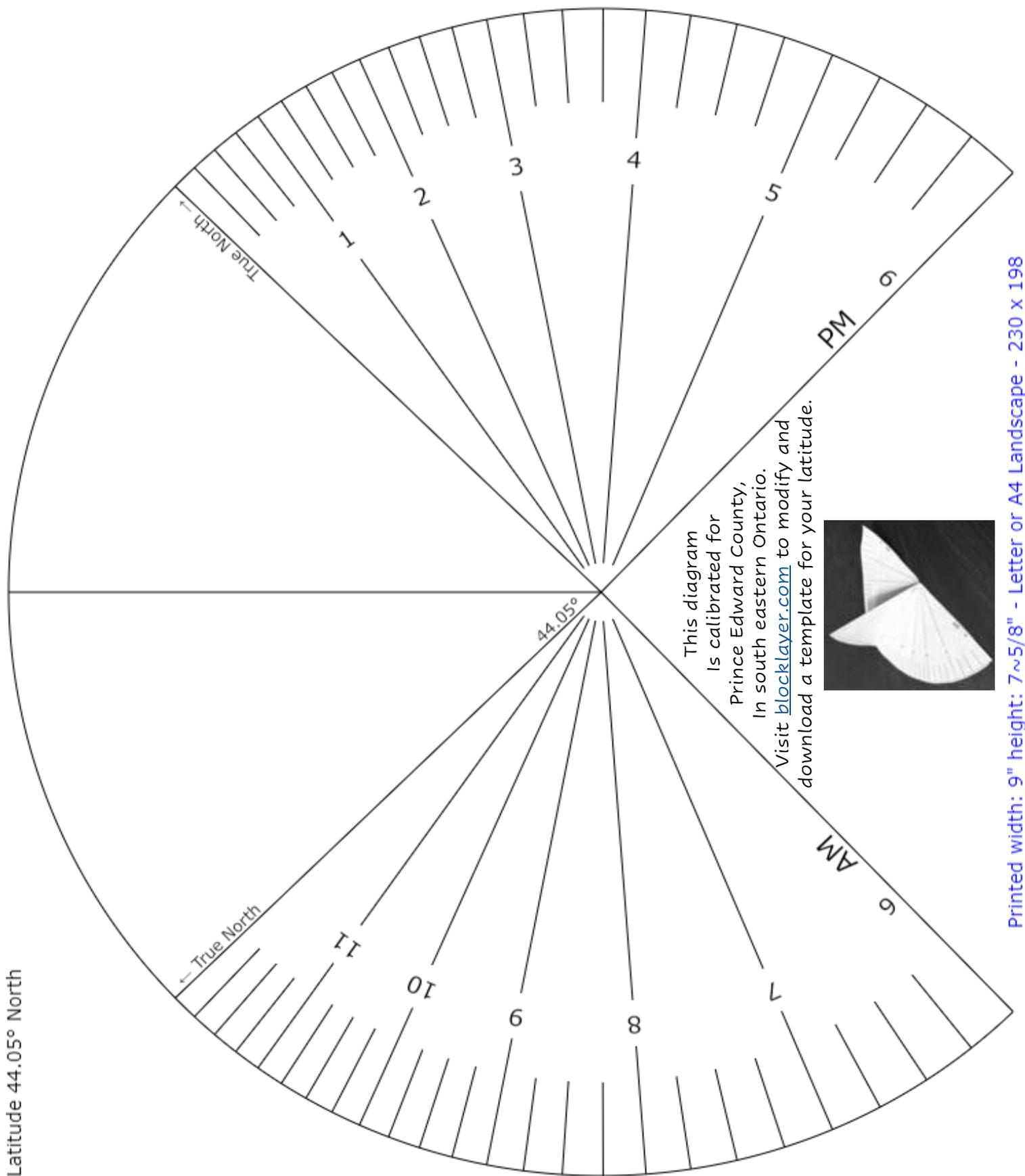
Try the attached templates and experiment with making accurate little sundials.



If you have the space, challenge your self to make a large sundial. You will need to consider seasonal changes in the sun's position.

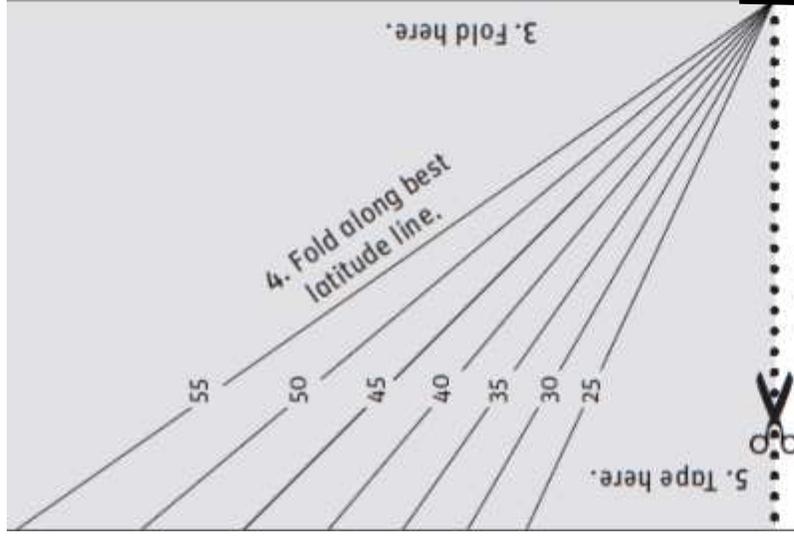


Celebrate the change of season by marking the sun's position for each solstice and equinox.



Printed width: 9" height: 7~5/8" - Letter or A4 Landscape - 230 x 198

- ◇ Print and cut around the outer edge of the Sundial diagram.
- ◇ Fold the centre vertical line up, and the 2 **True North** lines down to create a triangle, the gnomon. Make sure the gnomon stands vertically, at right angles to the Sundial face. Secure the gnomon with sticky tape. A thin piece of cardboard inside the fold can reinforce it.
- ◇ Place the Sundial flat and level, with the Gnomon (triangle) pointing toward True North in the Northern hemisphere).
- ◇ **OR** Use a clock to adjust rotation to correct time. (Adjust for daylight savings time if needed)

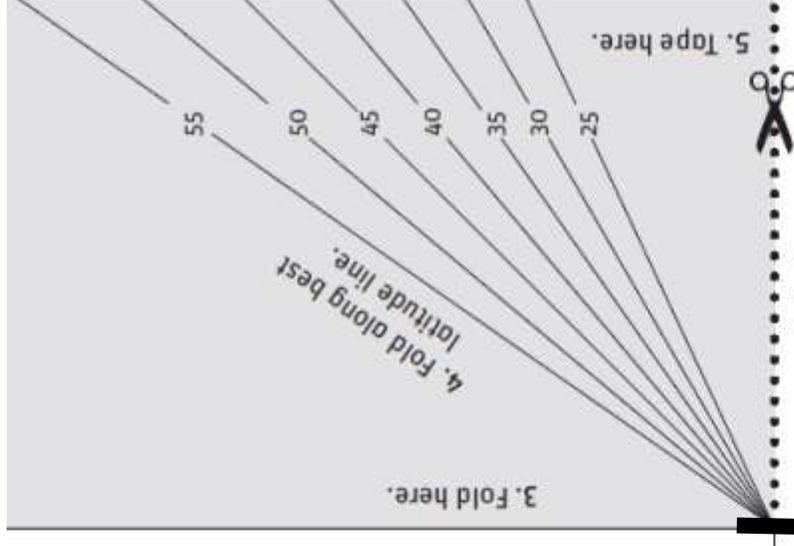


5. Tape here.

1. Cut here.

3. Fold here.

4. Fold along best latitude line.



5. Tape here.

1. Cut here.

3. Fold here.

4. Fold along best latitude line.



2. Fold here.

Northern Hemisphere Sundial

1. Cut in from edge of paper along dotted lines. Stop at solid lines.
2. Fold along solid horizontal line with line on outside. Crease, then open flat again.
3. Fold along solid vertical lines with lines on outside. Crease, then open flat again.
4. Select the latitude line closest to your latitude. Fold with line outside, crease, and fold again with line on *inside*.
5. Tape the paper together as shown at right.
6. Insert a sharp pencil point-first through the small circle at top center. Remove pencil and reinsert it with the eraser first.
7. If needed for stability or durability, tape the whole thing to a sheet of cardboard.
8. Turn the sundial so the pencil points due north, as determined by a map or a compass.
9. If you can't find north, orient the sundial so that it agrees with your clock. (Subtract one hour from the clock time if you're on daylight-saving time.)

