

## **Lengths of Shadows with the Sun Shining Directly On the Tropic of Cancer, Equator, and Tropic of Capricorn**

1. In which season are the shadows the shortest in Utah? Why?  
*During the summer season because the sun is shining more directly on the northern hemisphere.*
2. In which season are the shadows the longest in Utah? Why?  
*During the winter season because the sun is not shining directly on the northern hemisphere.*
3. Which two seasons are the shadows in the in the middle of long and short? Why?  
*During spring and fall because as the sun's light is shining directly on the equator. It is shining directly between the Tropic of Cancer and the Tropic of Capricorn and the shadows are shorter and the same length.*
4. How did we get the equator?  
*That is where the sun shines directly on the earth all day long.*
5. How did we get the Tropic of Cancer?  
*That is where the shines directly on earth on the Summer Solstice and is there all day. Then the sun will begin going back the other way and the days will become shorter.*
6. How did we get the Tropic of Capricorn?  
*That is where the shines directly on earth on the Winter Solstice and is there all day. Then the sun will begin going back the other way and the days will become longer.*
7. What do you notice about the light when the sun is shining on the Tropic of Cancer?  
*The light is shining directly on the northern hemisphere and causing the days to be longer and the days warmer there.*
8. What do you notice about the light when the sun in shining on the Tropic of Capricorn?  
*The light is shining directly on the southern hemisphere and causing the days to be longer and the days warmer there.*
9. Why is the sun higher in the sky during our summer time?  
*With the earth in the summer position, the light of the sun is shining directly on the northern hemisphere. This causes the sun to be more directly above us.*
10. Why is the sun lower in the sky during our wintertime?  
*With the earth in the winter position, the light of the sun is not shining directly on us. It is shining directly on the southern hemisphere. This causes the sun to be more lower in the sky above us.*

11. Why are the days shorter in the winter than summer and the days longer in the summer than winter?

***When the sun is nearly directly above us during the summertime it has more sky to be traveling through. When the sun is not directly above us during the wintertime, it has less sky to see to be traveling through.***

12. Graph the lengths of the shadows of each of the places you wrote down data.

13. What is this graph telling you?

***It tells us that during the summertime the shadows are not as long at noon that means that we have more direct sunlight and the days are warmer. It tells us that during the wintertime the shadows are longer at noon that means that we have don't have direct sunlight making the days colder.***

Comparisons of the Lengths of the Shadows

