

# Non-mathematical Questions

Many interesting observations about science can be made while enjoying the State Fair, not all of them requiring calculations. In this section we have made a list of some of them. There are other observations also, and we hope you will keep an eye out for things we did not include.

- Could you figure out the height of the rocket at the front gate using only its shadow and a yardstick?
- As a Ferris wheel turns, a mark on the side moves in a circular path. Why is this so? As you sit in the moving seat of the Ferris wheel, sometime your feet are “inside” the wheel and sometimes they are “outside” Draw a diagram to represent the path of the mark and the path of your feet. Do your feet move in a circular path?
- Try to diagram the paths of the more complicated rides. Mark where they are going fastest. Mark where the change in direction is sharpest and mark where the change in speed is greatest.
- If you carry a scale on the Ferris Wheel, do you expect things to weigh the same all around the trip? What would you expect at the top, bottom, and the two sides? Assume the wheel turns smoothly. Can you think of a way to test your ideas using a simpler method than riding a Ferris Wheel?
- If you carry a pendulum onto a merry-go-round would you expect its time-of-swing (period) to be different from that on the ground? How about other rides – such as the Ferris wheel or a roller coaster?
- What stops the falling cars in the Drop of Fear ride?
- What keeps the Drop of Fear tower from falling over? Why do you think they use what they use to hold it steady?
- What factors make it hard to toss a ring over a peg to win a prize? Look carefully at what happens, and see if you get some ideas.
- Look in the mirror at the fun house. Is there a connection between the way the mirror is shaped and the way your image is shaped? Try your ideas for differently shaped mirrors.

- What will happen if a skinny driver in a bumper car runs head-on into a heavy driver in a bumper car? What happens if one or the other car is not moving?
- When you run into another moving bumper car from behind is the impact bigger or smaller than if you ran into it head-on? Why?
- Why does the bumper car ride have a ceiling? Can you draw an electrical circuit diagram for the bumper car ride?
- Are the rides and the Midway illuminated primarily by incandescent or by florescent lamp bulbs? Why?