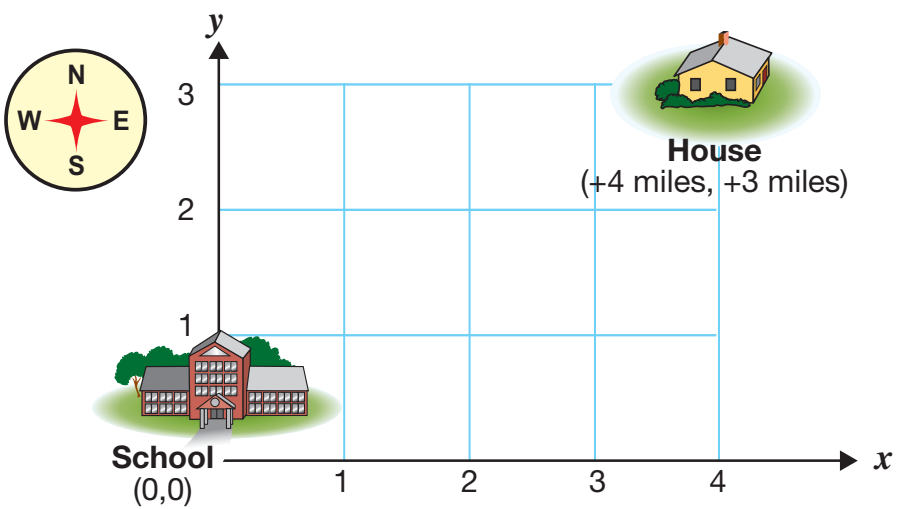
Position in two dimensions

Motion in a line, on a plane, and in space

If an object can only move in a line, its motion is called one-dimensional. Motion on a flat surface (a plane) is two-dimensional. How you describe an object's position depends on whether you are studying its motion in one or two dimensions. A single number fully describes position in one dimension. Two numbers are needed to describe position in two dimensions (Figure 12.4).

Coordinates describe position

Two number lines at right angles to each other are used to show position in two dimensions. The two number lines make up what is called an *x-y plane*. Two numbers, called *coordinates*, are used to describe the position. The x-coordinate describes the position to the left/right or east/west. The y-coordinate describes the position up/down or north/south.



You must define an origin

You can describe the position of your house compared to your school on an *x-y* plane. Let your school be the origin. It is convenient to define the positive *x*-direction as east and the positive *y*-direction as north.Your house is 4 miles east and 3 miles north. The coordinates for this position are (+4 miles, +3 miles).

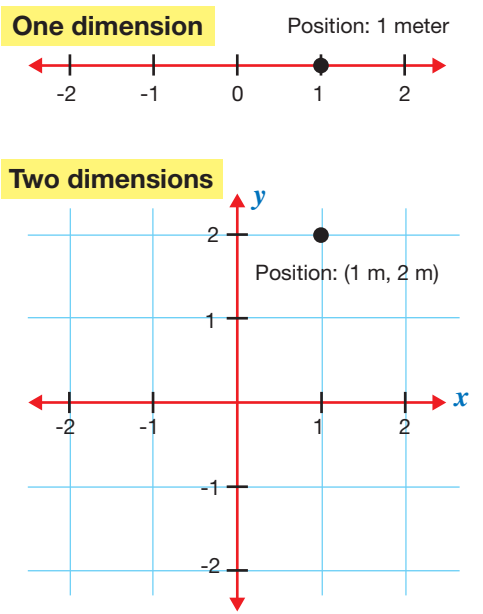


Figure 12.4: *The number of numbers needed to describe an object's position is the same as the number of dimensions.*