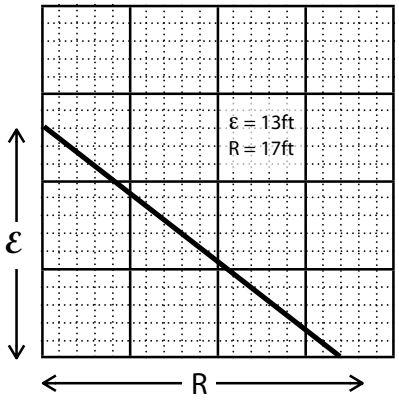
PhyzJob: Playground Physics 101
Understanding the Slide

Slide Design Parameters
Elevation ($\mathcal{E}$)
This parameter specifies **how high** the top of the slide is from the bottom. In other words, it's the height of the ladder.

Run Length (R)
This parameter specifies **how far** the end of the slide is from the base of the ladder.

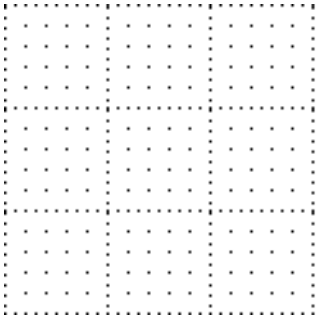
Incline (I)
This parameter specifies **how steep** the slide is. Note that if there is a continuous supply of slide riders, this parameter will also determine the "flow rate" of passengers.



Please answer the following questions regarding the interrelation of these design parameters.

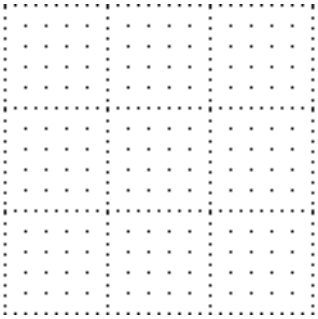
I. How Does Slide Elevation Affect Incline (or Maximum Flow Rate)?

A. Draw a slide with an elevation of 10 ft and a run length of 10 ft.



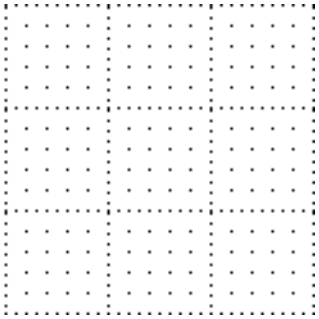
$\mathcal{E}$ = 10 ft
R = 10 ft

B. Draw a slide with an elevation of 15 ft and a run length of 10 ft.



$\mathcal{E}$ = _____
R = _____

C. Draw a slide with an elevation of 5 ft and a run length of 10 ft.



$\mathcal{E}$ = _____
R = _____

1. The **incline** (or maximum possible flow rate) of slide B is _____ that of slide A.

2. The **incline** (or maximum possible flow rate) of slide C is _____ that of slide A.

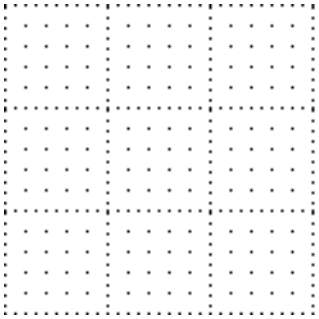
3. In what way is the **incline/flow rate** of a slide related to the **elevation** of a slide?

__a. As the elevation increases, the incline/flow rate increases.
__b, As the elevation increases, the incline/flow rate decreases.
__c. As the elevation increases, the incline/flow rate remains constant.

4. In mathematics, this is called a/n DIRECT / INVERSE / NONEXISTENT (circle one) proportion.

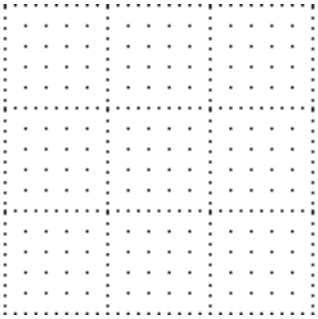
II. How Does Slide Run Length Affect Incline (or Maximum Flow Rate)?

A. Draw a slide with an elevation of 10 ft and a run length of 10 ft.



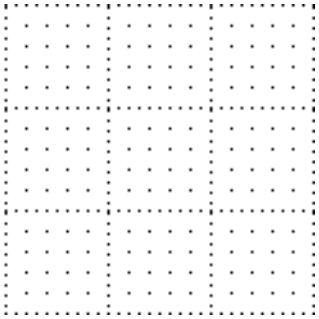
$\mathcal{E}$ = 10 ft
R = 10 ft

B. Draw a slide with an elevation of 10 ft and a run length of 15 ft.



$\mathcal{E}$ = _____
R = _____

C. Draw a slide with an elevation of 10 ft and a run length of 5 ft.



$\mathcal{E}$ = _____
R = _____

1. The **incline** (or maximum possible flow rate) of slide B is _____ that of slide A.

2. The **incline** (or maximum possible flow rate) of slide C is _____ that of slide A.

3. In what way is the **incline/flow rate** of a slide related to the **run length** of a slide?

__a. As the run length increases, the incline/flow rate increases.
__b. As the run length increases, the incline/flow rate decreases.
__c. As the run length increases, the incline/flow rate remains constant.

4. In mathematics, this is called a/n DIRECT / INVERSE / NONEXISTENT (circle one) proportion.

III. Putting It Together

1. Write an equation for the **incline** I of a slide in terms of its **elevation** $\mathcal{E}$ and **run length** R**.**

2. In each case listed below, circle the parameters that describe the slide with the higher maximum flow rate.

a. i. $\mathcal{E}$ = 12 ft, R = 3 ft or ii. $\mathcal{E}$ = 3 ft, R = 12 ft or TIE

b. i. $\mathcal{E}$ = 8 ft, R = 12 ft or ii. $\mathcal{E}$ = 24 ft, R = 36 ft or TIE

c. i. $\mathcal{E}$ = 364 ft, R = 272 ft or ii. $\mathcal{E}$ = 864 ft, R = 648 ft or TIE

3. **Calculate** the inclines for the slides listed in question 2.c. above using the equation you developed in question III-1.