

Suggestions for experiment at home :

1. Make experiments similar to 1, 2 and 3.
2. If you have a small express wagon use it in experiments similar to 1, 2 and 3.

Exercises

1. State the law of the inclined plane.
2. If it takes 2 lbs. of force to drag a 10 lb. weight along a smooth pine board, how much would it take if the board were inclined 1 foot in 10 ft.?
3. A wagon and its load weigh 1 ton. If it takes 50 lbs. pull to move it on a level road, what is the total pull on a road which has a grade of 5%; i.e., rises 5 ft. in 100 ft.?
4. A barrel of oil weighs 240 lbs. It is being rolled up a plank into a wagon. The plank is 12 ft. long, and the bottom of the wagon is 3 ft. above the ground; what force is necessary?
5. If the wagon and load mentioned in exercise 3 go down a grade of 2%, how much would the horses need to pull? If the grade were 4%, would they pull or hold back, and how much?

Lesson XVI

Record the weather conditions.

What were the results of your experiments with a wagon going up hill?

In the last lesson we found that it was harder to pull a weight up hill than on the level, and that if, for example, the hill rose 1 foot in going along the incline 10 ft., that then the increased pull was $\frac{1}{10}$ of the total weight. If the hill rose 2 ft. in 25 ft., then the increased pull would be $\frac{2}{25}$ of the total weight, etc.

Let us look at this going up hill, or the inclined plane, from the standpoint of the law of machines. Let us suppose that a wagon and its load weighed 1 ton (2,000 lbs.),