

## HARDNESS OF WOOD AND MODIFIED WOOD

STUDENT BOOK Chapter 12, page 374

### GOAL

Compare the hardness of various types of wood and modified wood.

1. What is the independent variable in this lab? \_\_\_\_\_

2. What is the dependent variable in this lab? \_\_\_\_\_

### HYPOTHESIS

I think that \_\_\_\_\_

because \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### MATERIALS

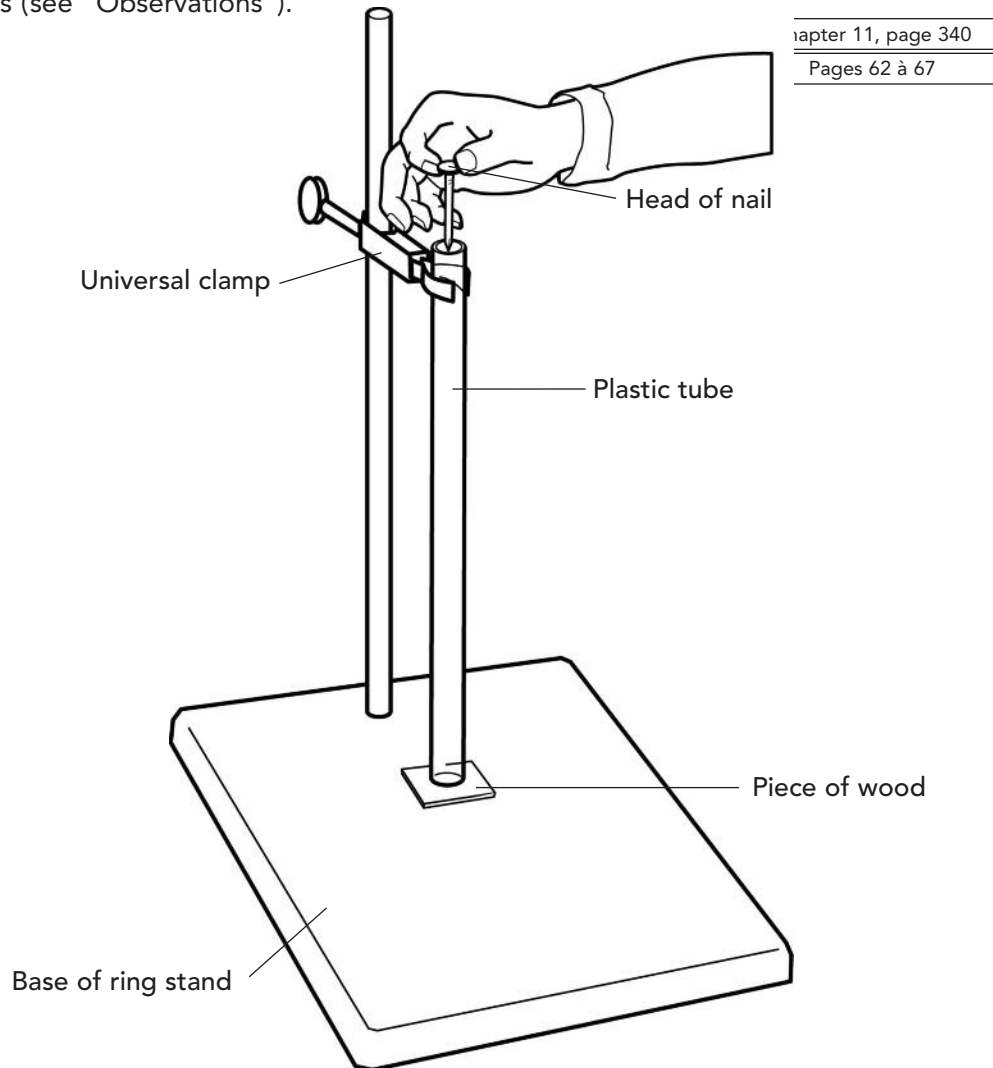
- ring stand
- universal clamp
- 10-cm iron nail
- 1-m plastic tube
- 5 pieces of wood and modified wood of equal size (about 20 mm × 20 mm):
  - pine
  - spruce
  - oak
  - maple
  - fibreboard

### PROCEDURE

1. Set the ring stand on the floor.
2. Place the plastic tube vertically over the base of the ring stand, allowing about 10 cm of space between the tube's lower end and the base of the stand.
3. Keeping the plastic tube in place, attach the tube to the ring stand with the universal clamp.
4. Set the material to be tested under the plastic tube.
5. Insert the nail into the tube while pinching the head of the nail between your thumb and index finger.
6. Lower your hand until the fingers holding the nail come into contact with the tube opening. (See the setup on the next page).
7. Open your fingers and let the nail drop into the tube.
8. Set the material you tested aside.



9. Repeat Steps 4–8 with each other material.
10. Categorize these materials according to the depth of each hole the nail makes after it falls (see “Observations”).



## OBSERVATIONS

Categorize the materials you tested according to the depth of each hole made by the nail after it falls (1 as material with the shallowest hole and 4 as material with deepest hole).

- |          |          |
|----------|----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ |          |

## REFLECTING ON YOUR OBSERVATIONS

1. What is meant by hardness when speaking of the mechanical properties of materials?

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2. Based on your observations, which material tested is hardest and which is softest? Explain your answer.

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3. There are other mechanical properties beside hardness. Name at least four of them.

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4. Of the materials you tested, which of them were made of:

- a) hardwood? \_\_\_\_\_  
b) softwood? \_\_\_\_\_  
c) modified wood? \_\_\_\_\_

5. Compare the hardness of the hardwood and the softwood you tested.

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## CONCLUSION

1. Categorize the materials tested in decreasing order of hardness.

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2. Did this experiment allow you to verify your hypothesis? If the answer is yes, explain whether your hypothesis was confirmed or not.

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## APPLICATION

Hardwood is generally preferred for floor coverings in houses. What is the advantage of using this type of wood?

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