

## Suggestions to Teachers (Joule and energy)

### Expected results

**After the lesson, the students are expected to:**

1. Describe the function of the device, which was constructed by Joule, when he demonstrated the relation between the mechanical work and the heat.
2. Experiment with the simulation concerning the Joule's experimental device for the mechanical equivalent of heat.
3. Reach to conclusions about the relation between the height and the increase of temperature of water in the Joule's simulation.
4. Calculate the quotient  $W/Q$  for the values of the mechanical work  $W$  and the heat  $Q$  in the Joule's simulation.
5. Explain how the most accurate calculation of the value of the relation between the mechanical work and the heat is achieved, by the progress of science.
6. Locate, based on the papers were published by Joule, the prevailing scientific views about the heat.
7. Describe how the scientific views are progressed.

### About the activities of students

The proposed students' activities are indicative and they aim at the accomplishment of the above expected outcomes. Moreover, the teacher may choose some of them for the teaching process in relation to its aims, the needs of students and the available time. Finally, she/he can create her/his own activities.

About the emergence of the characteristics of science in the narration, these characteristics are quoted in the website, comprehensively (in classification of the stories by NOS).

About the locating of the characteristics of Nature of Science in the proposed activities, indicatively, we can quote the following:

A) The activities 2 and 3 concern the characteristics of Nature of Science: a) "Science demands and relies on empirical evidence" and b) "Science has a subjective element".

B) The activities 4 and 5 concern the characteristics of Nature of Science: a) "Science demands and relies on empirical evidence" and b) "Laws and theories are related but distinct kinds of scientific knowledge"

C) The activity 6 concerns the characteristics of Nature of Science: a) "Scientific knowledge is tentative but durable" and b) "Science demands and relies on empirical evidence".

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