

JAF02 Unit 2 Motion

Task 1 What is the one word missing in all the sentences below?

When do the new regulations come into _____?

The moon exerts a _____ on the earth.

She felt horrible, but managed to _____ a smile.

Ron is the driving _____ behind the project.

We will achieve much more by persuading people than by brute _____.

Task 2 Motion and the force of gravity

Put the phrases in the correct order to make sentences.

1. falls to the ground. like a coin, or a piece of paper, the object If you drop an object
2. because force gravity. is of of the This
3. a force that works a non-contact force, Gravity that is, is an example of the object. without actually touching
4. and then holds them causes down on the Earth's surface. Gravity objects that have no support to fall,
5. any objects exists between Gravitational force the force. the greater the greater the masses, which have mass;

Hypotheses

Using English to hypothesise

A hypothesis is a tentative proposition that resolves a problem or answers a scientific question. A theory is a hypothesis that is generally accepted.

Most hypotheses are stated in present simple tense, although it is possible to hypothesise about something that happened in the past or will happen in the future.

Task 3 Identifying hypotheses in sentences

Circle a or b in each of these pairs of sentences to indicate the one that can be considered a hypothesis.

1. a) Migration is the seasonal movement of animals from one place to another.
b) Birds may be guided in their migration by the position of the sun or stars.
2. a) Rocks fall faster than feathers.
b) There may be a fifth force in nature that causes objects to fall at different rates.

3. a) Certain types of music may relieve stress.
b) During the Middle Ages, music was used to treat certain diseases.
4. a) Some elephants, whales and dolphins have brains larger than the human brain.
b) Dinosaurs may have become extinct because their brains were not proportional to their physical strength.
5. a) Excessive amounts of cholesterol might cause heart attacks.
b) Egg, cheese, and fatty meals all contain cholesterol.

Task 4 Hypothesis – Collocations

Study the collocations with the word *hypothesis*, and then use some of them in sentences.

A bold hypothesis, a working hypothesis, to construct a hypothesis, to propose a hypothesis, to test (out) a hypothesis, to confirm a hypothesis, to accept a hypothesis, to reject a hypothesis, a hypothesis predicts sth., a hypothesis concerns sth.

Task 5 Galileo and the Leaning Tower of Pisa

Complete the hypotheses:

Aristotle's hypotheses:

Objects fall with a speed proportional to their _____ .

The natural state of an object is to be at _____ and a force is necessary to keep an object in motion.

Galileo's hypotheses:

All bodies fall at _____ rates.

If an object does not meet with _____, it will continue to move at a constant speed even if no force is applied.

Task 6 Now use the phrases below to tell the story of the famous experiment.

dropped stones or cannonballs – to determine experimentally – to question Aristotle's view – reach the ground – the same acceleration – the heavier the object – natural place

Task 7 Discussion

1. Form a hypothesis to explain why some students succeed in their school work while others, with equal ability, fail.
2. Form a hypothesis to explain why physics is not a popular subject at school.
3. Form a hypothesis to explain why some people do not wear seat belts in their cars.
4. Form a hypothesis to explain why the western society increasingly suffers from heart disease.

Task 8 Reading comprehension

Fill in the gaps with the clauses given below.

Some Notions About Motion

Which falls faster, a blade of grass or a stone? Anyone can see that a stone falls faster and _____ (1). Based on everyday experience, Aristotle determined that _____ (2) and that objects fall with a speed proportional to their weight.

Aristotle also studied horizontal motion. He observed that whenever he pushed a rock or other object, it always rolled for a while and _____ (3). He hypothesised that the natural state of an object is to be at rest and _____ (4). Aristotle's hypotheses were accepted for two thousand years because _____ (5).

It was not until the early 1600s _____ (6). Galileo was not content to accept ideas without verifying them with experiments. He dropped various weights from a height and _____ (7). Disproving Aristotle's hypothesis, he determined that all bodies fall at equal rates, if you discount the air resistance. A blade of grass will fall more slowly than a stone only because _____ (8).

- A) they were consistent with logic and informal observation
- B) then came to rest
- C) recorded the results
- D) that these long-established beliefs were challenged
- E) it meets with more resistance from the air
- F) that is what the ancient Greeks believed
- G) a force is necessary to keep an object in motion
- H) heavy objects fall faster than light objects

(Task 2 – Kelly, K. *Science*. Macmillan, 2007

Task 4, 5, the text for task. 8 adapted from Zimmerman F. *English For Science*. Prentice Hall Regents, 1989)