

## FEEDING

### 7. Fast Food

**Objective:** Students will calculate rates of feeding for the average baleen whale, and compare the energy requirements of whales with humans.

**Level: 6-7**

**Background:** Whales consume great quantities of food, which they need to power their enormous bodies and to maintain body heat. All mammals must expend energy to maintain a stable body temperature, but this is especially difficult for whales who would lose a considerable amount of body heat to cold ocean water were it not for their blubber. The larger whales must consume 500,000 to a million calories per day. To get these calories, an average-sized baleen whale consumes 2,000 kg (4,400 pounds) of food per day during the summer. About 25% of the food is stored as fat, called blubber, which serves as both insulation and an energy reserve necessary for surviving the winter when less food is available. A typical human weighs 67.5 kg (150 pounds) and takes in 2,500 calories per day. A whale weighing about 45 tonnes needs at least 395,000 calories per day. A whale of this size may spend 15 hours a day feeding in the summer months.

**Materials:** pencils, paper and calculators.

**Procedure:**

Have the students calculate the following:

- 1) If a whale's mouth opening is 1.5 m<sup>2</sup>, and the average density of copepods is 9500 per m<sup>2</sup>, how many copepods can a whale ingest in one mouthful?
- 2) If a whale ingests 500,000 calories per day, how many calories is it ingesting per minute?
- 3) Investigate your own consumption figures:
  - a. Estimate the number of minutes you spend per day feeding.
  - b. If you ingested 2,500 calories in one day, how many calories would you ingest per minute? (*Hint:* don't forget your answer to question 3a.)
- 4) Compare your caloric intake per minute with that of a whale. What factors account for the difference in intake? How does food availability differ for baleen whales and humans?