

Ohio Science Education Standards

Grade 4: Science and Technology: Understanding Technology

1. Explain how technology from different areas (e.g., transportation, communication, nutrition, healthcare, agriculture, entertainment and manufacturing) has improved human lives.
2. Investigate how technology and inventions change to meet peoples' needs and wants.

Grade 4: Science and Technology: Abilities To Do Technological Design

1. Describe, illustrate and evaluate the design process used to solve a problem.

Grade 4 Nature of Science

1. Differentiate fact from opinion and explain that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed.

RAISING PIGS YESTERDAY AND TODAY

Many Pork Producers operate farms that have been in the family for years. But ways of doing business have changed. Science and technology have played an important role in making changes that have improved the care of the animals and the quality of the food product.

Many people think pigs live in plush green pastures, roll around in mud, and eat nothing but "slop." A pig's sharp hooves and tendency to root around with their strong noses can tear up a pasture and leave nothing but mud. Today's pork producers take care of the pigs by keeping them in climate-controlled barns year-round. Modern systems are less labor intensive than raising pigs outside.

Farms are bigger because technology enables one person to better care for more animals than in the past. Barns have automated feeding and watering systems and securely contain manure. Ventilation "cool cell" systems circulate air in the summer and heaters keep the pigs warm in the winter. Nutrition is important and the diet of corn, soybeans, vitamins and minerals is carefully calculated. The gestation time for sows is closely monitored so that baby pigs arrive on time and safely. The manure, or nutrients, is continually being collected and stored under the barn in pits, or outside the barn in lagoons. Manure is an organic fertilizer used to produce crops. Those crops are harvested for feed for the animals, which, in turn, produce more manure. This continuous cycle is an integral part of a sustainable agricultural system.

As farms have grown many family run operations have chosen to incorporate as part of their business plan. The family members still have the ultimate responsibility for ensuring that the animals are well cared for, the manure is stored, handled and applied properly and that the farming operation is considerate of neighbors.

FACT AND OPINION

Learning to distinguish between fact (statements that can be proved true) and opinion (statements that express judgments or ideas) helps students to evaluate what they read, hear, view, and write.

Explain that a statement is a fact if you can answer “yes” to these two questions: “Is it true?” and “Can it be proved?” A statement of opinion can be very well thought out but cannot be proved true or false - it is always open to debate. To spot opinions, look for “key” words that often accompany opinions: think, believe, suggest, probably, perhaps, and usually. Other key words that call for personal interpretations and judgements include: bad, good, best, worst, most, beautiful and dangerous.

Recognizing statements of opinion is sometimes confusing. Sometimes students say “Pigs are cute,” and because they can give an example from their own experience. They don’t realize that someone might interpret “cute” in more than one way. Interpretations come into play. Adjectives that express judgments include: brave, funny, strong and cute.