9.3 Polymers

Reading Focus

Key Concepts

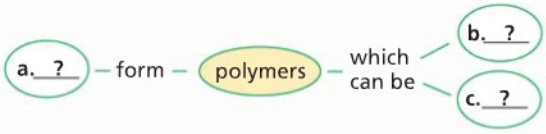
- What is one way that polymers can be classified?
- What are three examples of synthetic polymers?
- What are four types of polymers that organisms can produce?

Vocabulary

- polymer
- monomers
- carbohydrates
- nucleic acids
- amino acid
- protein

Reading Strategy

Identifying Main Ideas Before you read, copy the concept map. As you read, complete the map to summarize two main ideas about polymers.



Freight trains, like those in Figure 13, use different types of cars to transport goods. A flatcar with no sides or roof is used to haul steel beams. Grain is carried in covered hoppers, which have a hatch at the top and a chute at the bottom. Liquids travel in tank cars. The cars on a train may be all the same type or a mixture of different types. On average, about 100 cars are linked together behind the locomotive on a freight train.

Like freight trains, some molecules are built up from smaller units linked together. A **polymer** is a large molecule that forms when many smaller molecules are linked together by covalent bonds. The smaller molecules that join together to form a polymer are **monomers.** *Poly-* means "many." *Mono-* means "one." In some polymers, there is only one type of monomer. Other polymers have two or more kinds of monomers.

Polymers can be classified as natural polymers or synthetic polymers. Many important types of biological molecules are natural polymers. Organisms produce these polymers in their cells. Synthetic polymers are developed by chemists in research laboratories and manufactured in factories. Both types of polymers have industrial uses. For example, silk and cotton fabrics are woven from natural polymer fibers, while polar fleece is made from a synthetic polymer.

Figure 13 Couplers that interlock like the fingers of your hands connect one railroad car to another. Many cars can be joined together to form a train, because there is a coupler on both ends of a car. **Using Analogies** ***How is a polymer like a train?***