

## Episode 22 - The Age of Polymers

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1. What determines the name for an age (stone age, bronze age, etc.)?
2. What are some examples of polymers in nature?
3. What is the common starting material for most manmade polymers?
4. In fractional distillation \_\_\_\_\_ molecules travel to the top of the fractionating tower while \_\_\_\_\_ molecules collect at the bottom.
5. Arrange the following fractions in order from lightest to heaviest: asphalt, jet fuel, lubricating oil, gasoline, diesel fuel
6. What happens during catalytic cracking?
7. What is meant by a chain reaction?
8. What polymer is produced in the largest quantities?
9. Describe the differences between high and low density polyethylene.
10. What was the key to the design of PETE soft drink bottles?
11. Why are polymers so widely used in the automobile and aircraft industries?

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## Answer Key

1. What determines the name for an age (stone age, bronze age, etc.)?

*The type of material that is new to that era and is widely used to construct items.*

2. What are some examples of polymers in nature?

*Silk, wool, cotton, starch, rubber, DNA, RNA, etc.*

3. What is the common starting material for most manmade polymers?

*Crude oil*

4. In fractional distillation lighter molecules travel to the top of the fractionating tower while heavier molecules collect at the bottom.

5. Arrange the following fractions in order from lightest to heaviest: asphalt, jet fuel, lubricating oil, gasoline, diesel fuel

*Gasoline, jet fuel, diesel fuel, lubricating oil, asphalt*

6. What happens during catalytic cracking?

*Large molecules are broken down into smaller ones.*

7. What is meant by a chain reaction?

*The product of one step is a reactant in the next step. A reaction which repeats itself until one of the reactants is used up.*

8. What polymer is produced in the largest quantities?

*Polyethylene*

9. Describe the differences between high and low density polyethylene.

*Low density - side branching - stretches easily - plastic wrap*

*High density - no side branching - more rigid - milk jugs*

10. What was the key to the design of PETE soft drink bottles?

*Using layers of the polymer turned 90° to each other to increase strength.*

11. Why are polymers so widely used in the automobile and aircraft industries?

*They are light and reduce the overall weight of the object.*

