

## Breakfast Proteins

Construct a protein through cereal additions

### Materials and Preparation

Fruit flavored, donut-shaped cereal  
(ie. Froot Loops, Fruity Cheerios)  
String or chenille stem  
Pencil  
Paper



Write out a template for the cereal chain using letters to correspond to the different colors of the cereal (ie. YOPPRRGYYOP). Tape this down somewhere in the corner of the room and section off this area with some string. Put some scrap paper and things to write with next to the template.

### To do and notice

1. Tell people that the instructions to make a cereal chain are in the corner of the room. Since the instructions are taped down, they can use the scrap paper to help them remember the order.
2. Place a cup of cereal and some string in the main part of the room. People must do their construction in this area.
3. Have people compare their finished cereal chains. Is everyone's the same?

### What's going on?

Making the cereal chain is a model of how proteins are made in the cell. The initial template represents a single copy of DNA that sits in the nucleus of a cell and gives instructions for how proteins are made. In order to get this information to an area where proteins can be made, it must be copied into RNA, which is very similar to DNA, but has a different form. This is represented by the hand-written notes on the scrap pieces of paper. The copying process is called **transcription**. Just like in the cell, a single DNA template can give rise to many RNA transcripts. These transcripts move from the nucleus of the cell into the cytoplasm where ribosomes use the information to assemble proteins from amino acid subunits in a process called **translation**. In the cell, the genetic code dictates which amino acid residues correspond to a given DNA sequence, but in the cereal chain, it is usually obvious that the letters in the instructions correspond to the color of the cereal.

### Going Further

The cereal chain can be used to model chemical rules for protein folding and errors that can occur in the transcription/translation process.