Smithsonian

Creative Machines

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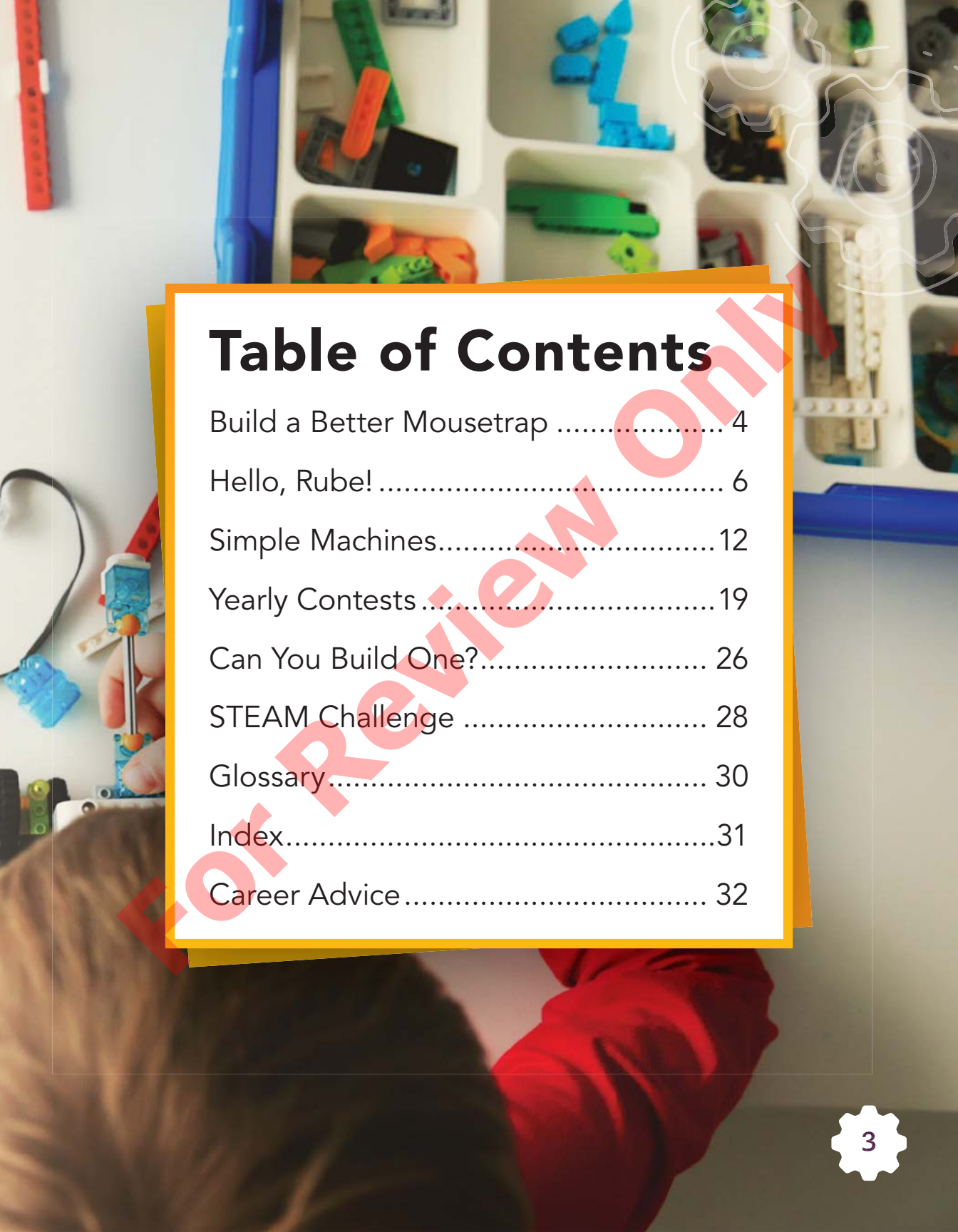

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Build a Better Mousetrap

If you want to butter bread, you spread it with a knife. If you want to open a door, you turn the knob and push. If you want to catch a mouse, you set a trap and wait for it to spring. But is there a better way?

A famous phrase is: "Build a better mousetrap, and the world will beat a path to your door." It means that everyone will want what you made. But if a simple thing works well, is there always a better way?

This mousetrap can hurt a mouse.

This mousetrap does not hurt a mouse.

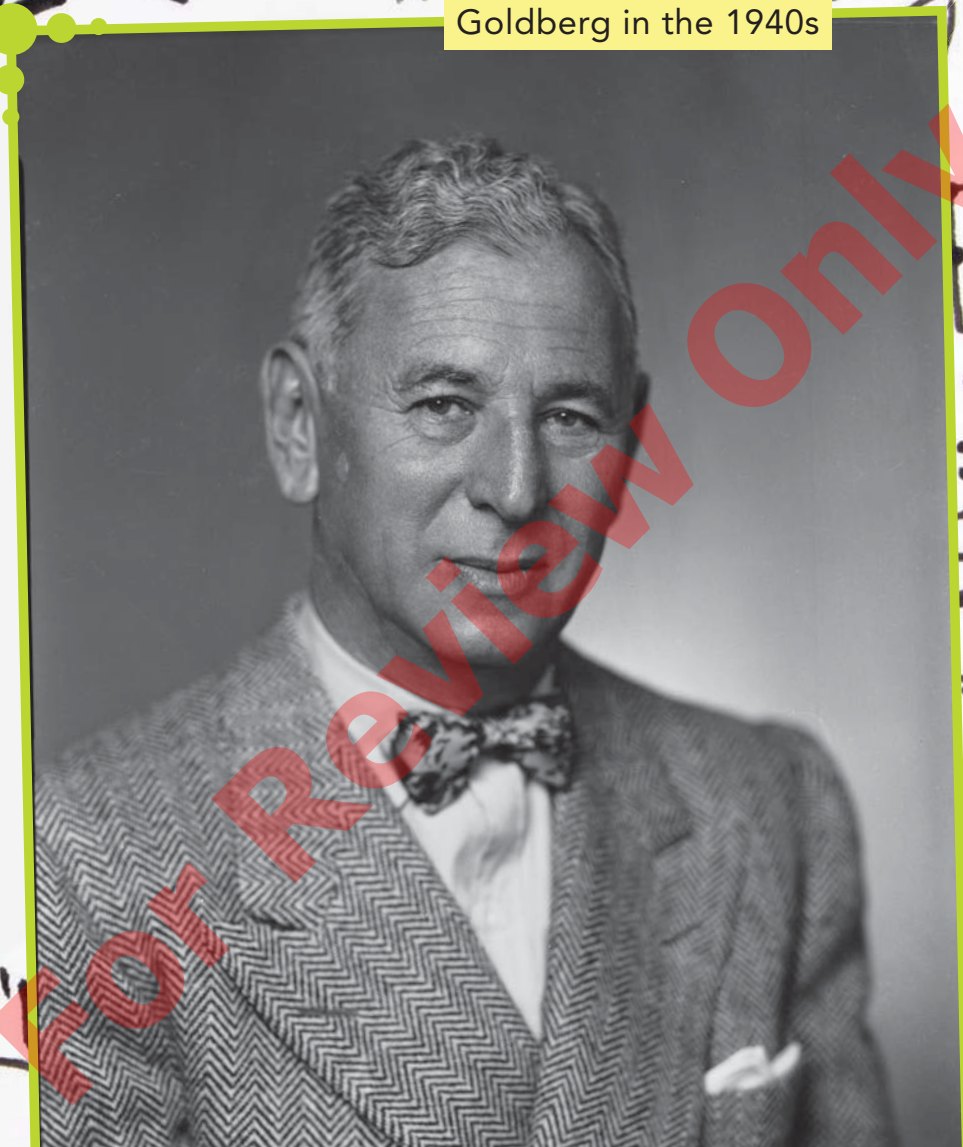
Hello, Rube!

On the Fourth of July in 1883, a baby boy was born. His name was Reuben Goldberg. People called him Rube (ROOB).

As a boy, Goldberg loved to draw. His father did not think drawing would get him far in life. He wanted Goldberg to become an **engineer**. So, that is what he studied in college. But his love of drawing did not go away.

Later, Goldberg left his high-paying job as an engineer. He became a **cartoonist**! He did not make much money, but it was work he wanted to do.

Goldberg stands with his wife and sons in 1929.



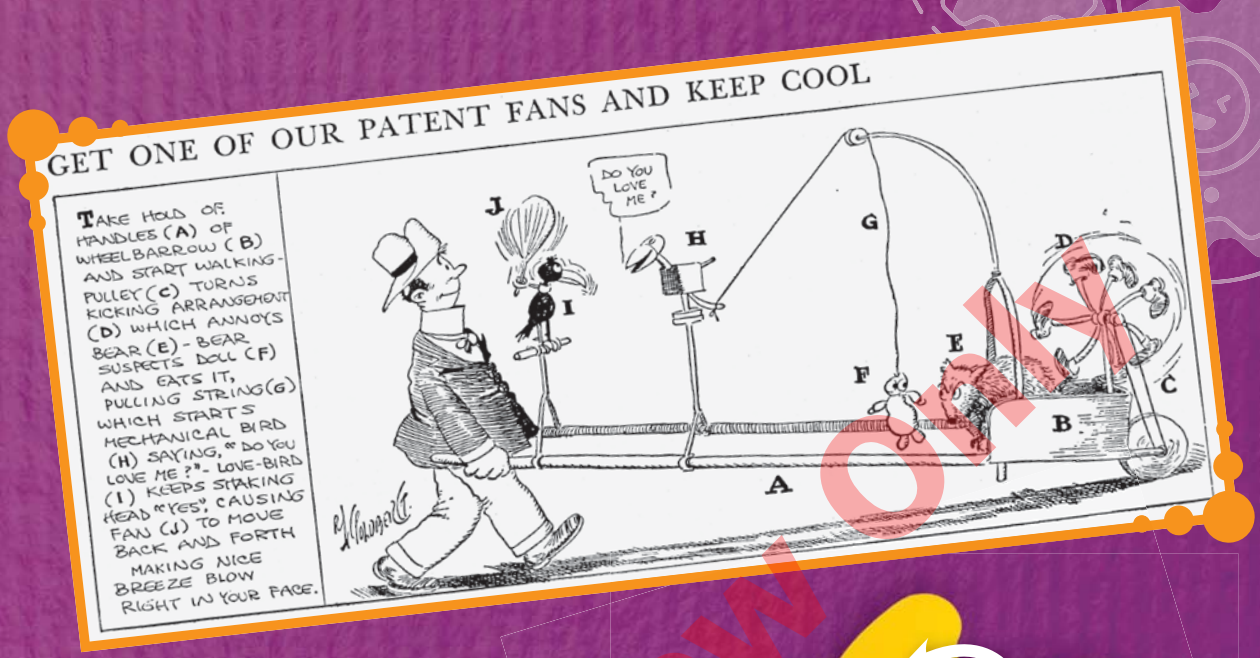
Goldberg in the 1940s

Goldberg drew a lot of comics. Some of them were about serious topics. They made people think. Other comics made people laugh. One of them even won a **Pulitzer Prize**!

Goldberg was also famous for his drawings of machines. The machines used tools to do simple tasks in **complex** ways. They made people laugh.

One of his most famous drawings was his napkin machine. Goldberg drew a complex way to use a napkin. It shows a series of causes and effects. The man uses the napkin but never has to pick it up.

This stamp shows Goldberg's "Self-Operating Napkin" machine.



Technology & Engineering

Cause and Effect

Engineers think about cause and effect. They know moving water will turn a waterwheel. They know wind will turn a windmill. They must know each action has a reaction. That helps them know what to expect.

STEAM CHALLENGE

Define the Problem

Create and test a machine for a mini Rube Goldberg Machine Contest.

Constraints: You must assemble your machine in 20 minutes or less.

Criteria: Your machine must flip a coin into a cup in less than two minutes. It must be made of at least two simple machines.

Research and Brainstorm

What are examples of simple machines? How do they help make compound machines?

Design and Build

Work with a group to plan your machine. What purpose will each part serve? What materials will work best? Build your model in 20 minutes or less.

Test and Improve

Test your machine. Did the coin land in the cup? Did it take less than two minutes to finish its task? How can you improve it? Improve your design and try again.

Reflect and Share

What was the hardest part about building your machine? Could you have used more simple machines in your model? Would it have made it more or less successful?