Make to Learn

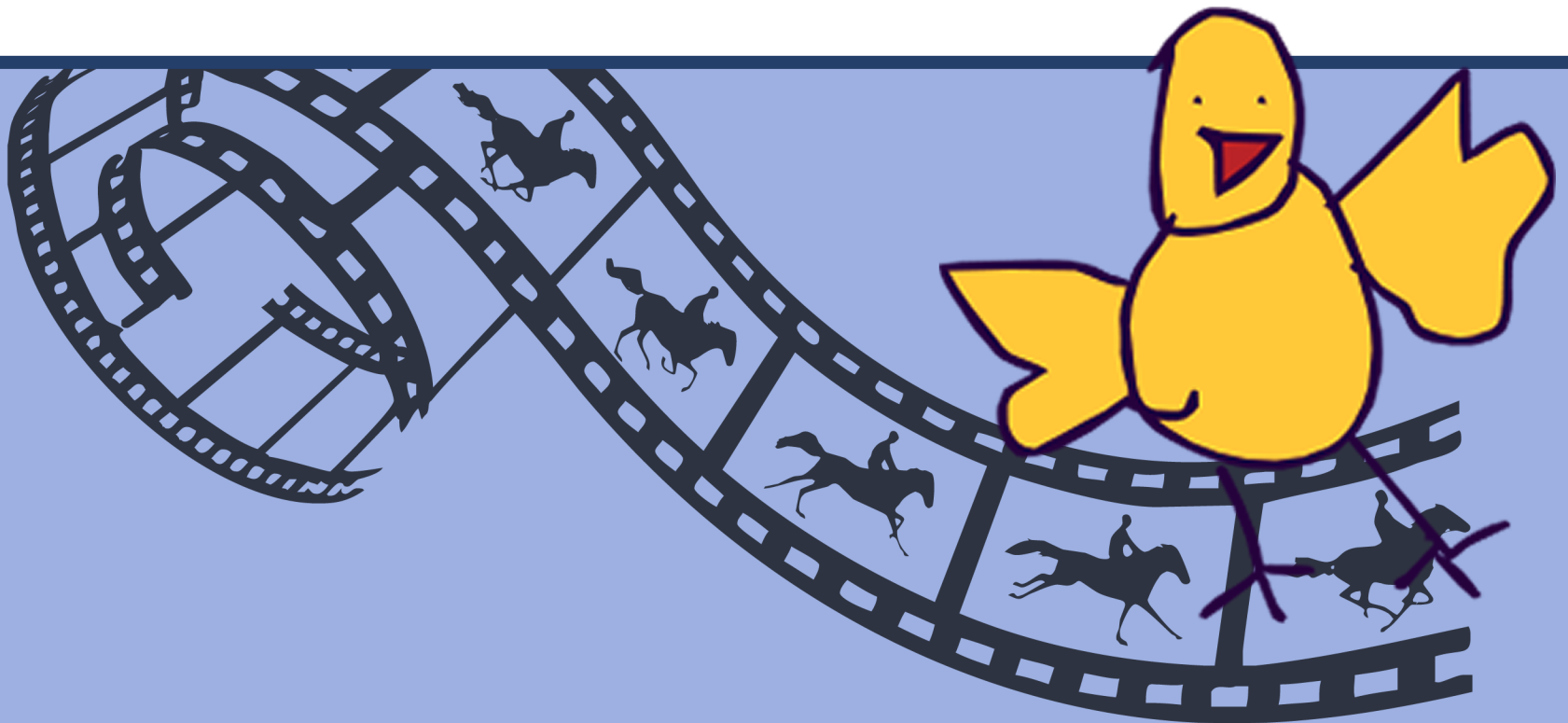## ANIMATION MACHINES

The Art of Storytelling

Make to Learn
ANIMATION MACHINES

The Art of Storytelling through Pictures

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and
Sheila Cochran

Illustrated by Golara Haghtalab
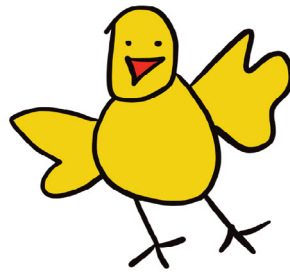
www.MakeToLearn.org

Preface

This illustrated book was developed to accompany makerspace workshops in which participants construct working models of the animation machines described in this book. The Association for Library Service for Children (ALSC), a division of the American Library Association, and the *Make to Learn Laboratory* at the University of Virginia are collaborating on a series of *Invention Kits* for library makerspaces.

The *Make to Learn Laboratory* previously developed a series of *Make to Learn Invention Kits* for school makerspaces in collaboration with the Smithsonian Institution. The current series of *Make to Learn Invention Kits* builds on this prior experience and adapts a new series of kits for informal learning spaces, such as museums and libraries.

A series of animation machines of increasing complexity and sophistication was developed in the nineteenth century and ultimately led to development of motion pictures as we know them today. This book provides an overview of animation machines that can be made in school, museum, and library makerspaces:

1. Flipbook Animations
2. Digital Flipbooks
3. Magic Disk (phenakistiscope)
4. Animation Cylinder (zoetrope)
5. Animation Machine (praxinoscope)

Accompanying instructions, materials, and fabrication files for construction of these animation machines are provided on the *Make to Learn* website at www.maketolearn.org

Animation is the art of telling stories through pictures.

Long ago artists told the story of their lives through paintings.
The paintings can still be seen on the walls of caves today.

Five thousand years ago artists drew pictures on plates and goblets. A goblet is a cup with a base and a stem. People turned the goblet like the one in this picture. The goat looked like it was moving.

These pictures tell a story about a goat.

ART ON A CUP
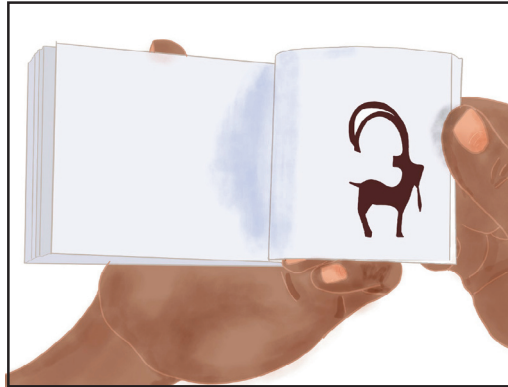*Pictures painted on the side of this goblet told a story.*

Each picture below is a tiny bit different. The goat moves little by little. It jumps up to eat a leaf.

This artist learned the basic idea of moving pictures.
Animation is another word for moving pictures.
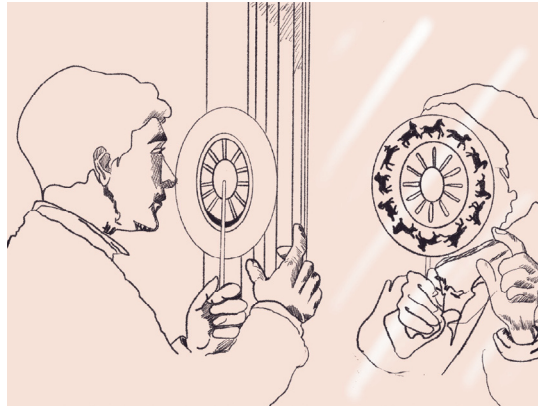Animations can be made in the same way today.

FLIPBOOK

A flipbook is a book with pictures that show an animation. Flipping the pages makes it look like the pictures are moving.

Each page of a flipbook shows a different picture. This flipbook shows the goat from the cup.

People looked through slits in the Magic Disk to see the pictures move.

ANIMATION CYLINDER

William Horner invented the Animation Cylinder. This animation toy had pictures inside a cylinder. People looked through slits to see the pictures move.

Only one person at a time could use a Magic Disk. The Animation Cylinder was better. A whole group could see the pictures together.

Artists had to draw pictures before photography was invented. Edweard Muybridge was a well-known photographer. He wanted to know if all the hooves of a galloping horse leave the ground at the same time.

Courtesy Library of Congress Prints and Photographs Division

Muybridge placed strings on cameras at a racetrack. A horse galloped through the strings. Each string pulled a lever on a camera and made it take a picture.

Muybridge learned that all four hooves do leave the ground at the same time. He wanted other people to see how horses run. He put the pictures in an animation machine. Now other people could see the horses moving. Muybridge later made many other animations.
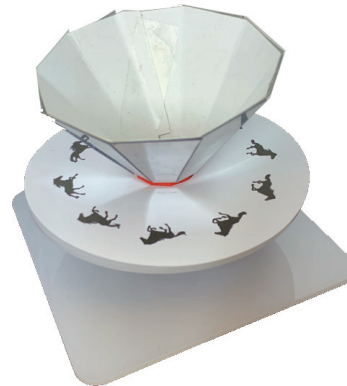

Search for "Muybridge" and "animals" on the Internet to see the animations that Muybridge made. People today download the pictures and cut them apart to make flipbooks.
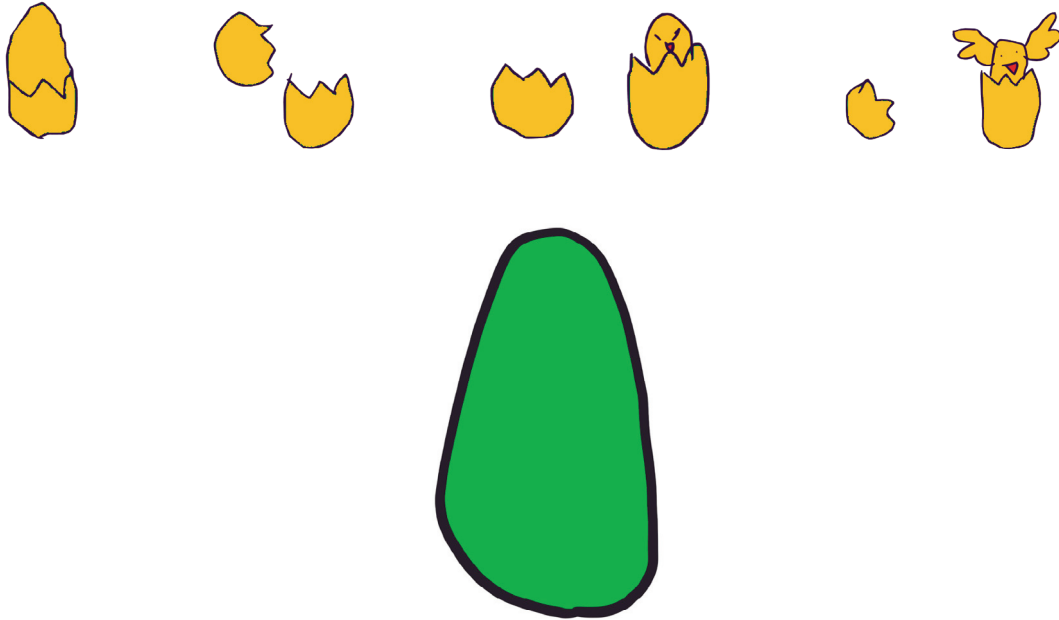
The Animation Machine shows moving pictures in a spinning cone. This invention is better than the Animation Cylinder. People can see the pictures directly. They do not need to look through slits to see the pictures move.

ANIMATION MACHINE
The pictures are on a spinning disk. You can see the pictures in mirrors on a cone. The pictures in the mirrors seem to be moving.
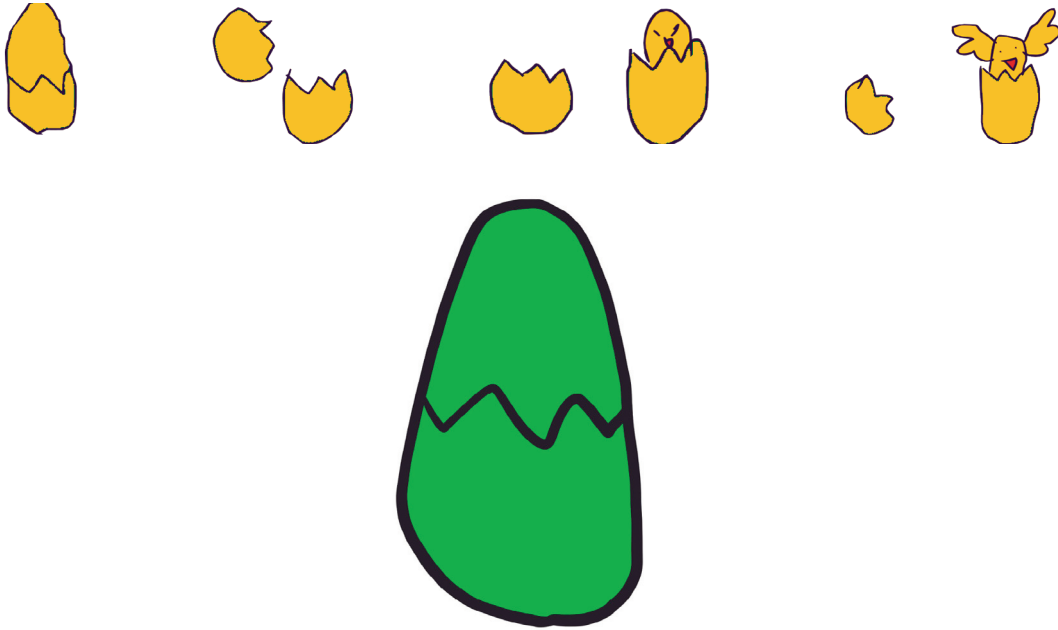
The picture above shows a Make to Learn Animation Machine with Muybridge's horses on the disk. Spinning the disk makes an animation.

You can tell a story with your own drawings.
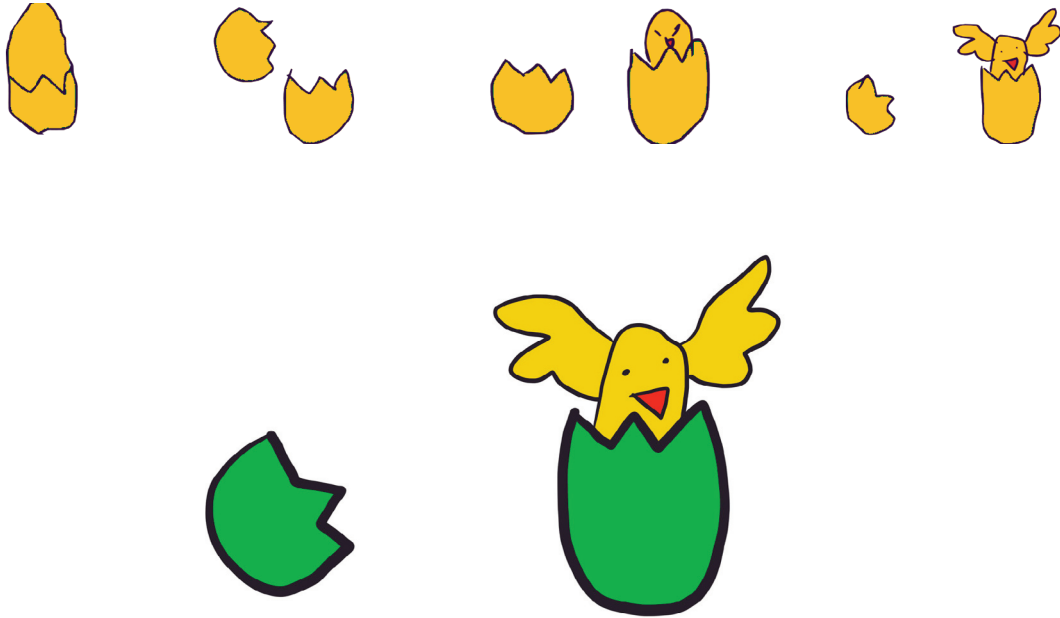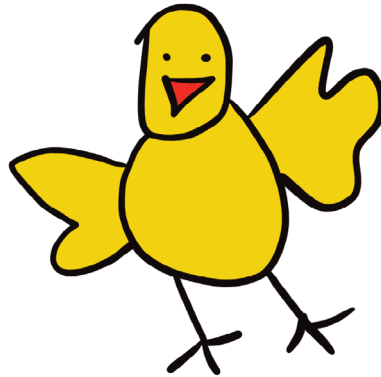The green object is the beginning of a story.

Is it a green rock?

Next, a crack is in the object.
What do you think is happening?
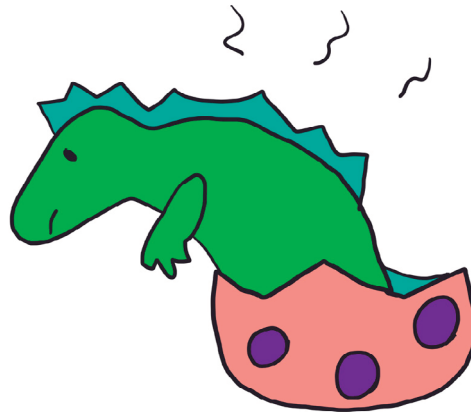
Something pushed the top away.
What is inside?

A chick is coming out of its shell!

Hello world!

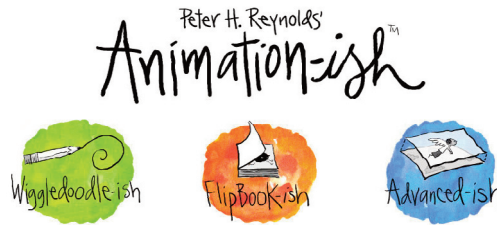Your story might have a different ending. Your shell might be a dinosaur egg.

Or maybe it holds treasure … or candy.

At one time story tellers went from town to town. They told stories to people in each town. They showed pictures with their stories. They used animation machines to show moving pictures.

You can also tell your own stories with pictures. Then you can show the pictures on an animation machine.

Computers can help you draw animations. Peter Reynolds is an artist. He invented a computer program to help draw animations.

Peter H. Reynolds'

Animation-ish™

Wiggledoodle-ish   FlipBook-ish   Advanced-ish

Peter was inspired by a young girl who said that she couldn't draw. Peter asked, "Could you draw a tree?" She said, "No … but I could draw something tree-ish."

Peter made his program for everyone who can draw something "tree-ish."

His program can be used to create flipbook animations

Drawings made on the computer can be used to make a paper flipbook.

You can also place pictures that you make on the disk of the Make to Learn Animation Machine.

A design program, *Maker Studio*, can be used to design and cut out the animation disk or you can use scissors to cut it out.

You can make your own animation machine. You can create animations with drawings or pictures.

You can make the pictures move with a paper flipbook.

You can also show the moving pictures on a computer screen.
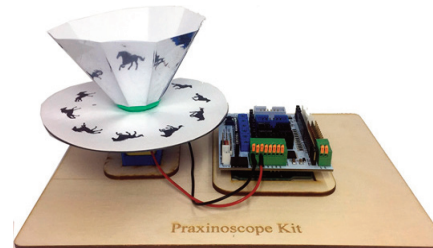

Drawing

Physical Machine

Photograph

Computer

People have always used pictures to tell stories. Long ago they painted pictures on cave walls. They later made machines to make the pictures move.

Make to Learn Animation Machines use these inventions and new technology to help you keep this storytelling tradition going.

www.MakeToLearn.org