

# Memory in Your World

## Preparation

Grade Level: 1–4

Group Size: 20–30

Time: 45 Minutes

Presenters: 3

## Objectives

This lesson will enable students to:

- Identify similarities and differences between machines with memory and machines without memory.
- Illustrate how a machine with memory might fit into the student's world.

## Standards

This lesson aligns with the following National Science Content Standards:



- Science and Technology, grades K–4

## Materials

- 2 manual adding machines – abacuses
- 2 calculators
- 2 manual typewriters
- 2 computer terminals
- 1 digital clock
- 1 winding clock
- 4 Simon games
- Magazines for follow-up activity
- Sample chips for each student

## Preparation

*If possible, the classroom teacher should be given background information about Micron so that the students can be introduced to the company prior to the presentation. This background information could include an aerial photograph of the plant and printed literature on the company.*

*Divide students into three groups. The groups will rotate through the three stations looking at and discussing the following machines:*

*Station 1: an abacus and a calculator*

*Station 2: a manual typewriter and a computer*

*Station 3: a wind-up clock and a digital clock*

*Group leaders will need to help students focus on the similarities and differences. This may involve explaining and showing how the machines operate. The leaders should also verbally summarize what the students discovered before they leave the station.*

## Introduction



You've already heard that I'm here from a company called Micron.

Q: How many of you know what we do at Micron? *Call on a few students for response.*

You've got some good ideas, and today I'd like to give you more information about what we do. To do that, we're going to talk about "memory".

Q: How many of you remember the first day you walked into this classroom?

Q: Did you know what desk to go to?

A: No, your teacher probably showed you which desk was yours.

Q: What happened when you came in this morning?

Q: Did your teacher show you which desk was yours?

A: No, you remembered where your desk was. That information is stored in your memory.

Q: What else do you have in your memory?

Raise your hand if you can remember your phone number? *Call on one student.* What is your phone number?

Q: How do you know that? Did someone tell you?

Q: Do they have to keep telling you?

A: No, after it becomes part of your memory, you can repeat that information every time someone asks you.

The company we work for, Micron is in the business of making memory. Now, we don't need to make memory for people because people already have brains to do that. We make memory for machines. This means we can show a machine how to do something and the machine will be able to repeat that action every time we ask it to.

Q: If we wanted to look at your memory, where would we look?

A: Yes, we would have to look at your brains, but we don't want to do that!

Q: Do you have any idea what the memory of a machine might look like?

A: *Hold up a sample chip.* This little tiny part is what we call a memory chip. This is what makes a machine remember how to do what we want it to do. *Distribute memory parts to each student.*

Each 512MB chip holds 512 million bits of information. That's the same as 40 books of 400 pages of text with 500 words per page. *Demonstrate by holding up a book with approximately 400 pages.*

Q: Can you imagine what it would be like if you didn't have any memory? What if someone had to show you everyday how to get to the lunchroom, or if you had to be shown everyday how to put your coat on, or if you had to be reminded everyday what your name is? Can you imagine how difficult your day would be?

We've been able to make some machines easier to use by adding memory to them. We've got some of those machines here in the stations we have set up. As you go from one to another, you'll be looking at one machine that doesn't have any memory, and then you'll look at the same type of machine with memory. We want you to look for two things:

- How the two machines are the same
- How the two machines are different

After everyone has been to each station, I'll be asking you to tell me how the machines are the same and how they are different.

## Station #1: Adding Machines

*Have students take a few minutes to study both the calculator and the abacus. Ask them to describe each one, and then ask them to consider these questions:*

Q: What does each of these machines do?

Q: Are the machines capable of doing the same tasks?

Q: What does memory have to do with each machine?

Q: Which machine, a calculator or an abacus, is easier for you to use? Why?

Q: Which machine gives you the answer faster?



Abacus



## Station #2: Writing Machines

*Have students take a few minutes to look at the typewriter and the computer. Ask them to describe each one, and then ask them to consider these questions:*

Q: Are the machines capable of doing the same tasks?

Q: What does memory have to do with each machine?



Q: What would happen to a computer if you took away its memory?

Q: What would happen to a typewriter if you gave it memory?

## Station #3: Clocks

*Have students take a few minutes to look at the analog and digital clocks. Ask them to describe each one, and then ask them to consider these questions:*

Q: How does each clock display the time?

Q: Do both clocks do the same thing?

Q: What does memory have to do with each clock?

Q: How do you think memory is used in digital clocks?



## Conclusion

Let's hear from the different groups about the similarities and differences you discovered.

*Briefly refer to each station and ask a few of the students what was discovered.*

The points you have identified clearly show that machines with memory are faster, sometimes smaller, and easier to use. You've seen a few machines this morning that have memory.

Q: What other items can you think of that have memory?

*Call on students for examples. Also, give them examples until their responses indicate a level of understanding.*

## Toys with Memory

Q: How many of you have used Simon before? *Show the Simon toy.*

Q: How do you suppose Simon knows to make sounds and light up?

A: Simon has memory chips inside, which tell the machine how to make sounds and light up. This game actually tests your memory against Simon's memory.



It works like this. *Give a brief demonstration. Instructions are located in the toy box. As time permits, have students try the game.*

## Follow-up Activity

*The teacher may provide magazines to look through so that students can find pictures of machines or toys that use memory. Students cut out pictures and draw scenes showing how that toy or machine might fit into the student's house or bedroom. Students should decide in what room they would like to have the machine, draw that room, and glue the picture in place.*

*While doing this activity, students take turns using the Simon games to test their memory against Simon.*