SCS Outreach Roadshow Script

**Slide 1:**

Hello everyone and welcome to the Carnegie Mellon School of Computer Science Roadshow.

Maybe one day we will see you and do the Roadshow together, for now we’ll take you through our presentation online.

By the way, it might help to have pen and paper ready for a couple of the fun exercises later on.

**Slide 2:**

My name is Kayla, my picture is on the left and here you can see 3 others in our team: Angela, Crystal and Ishika.

**Slide 3:**

Let’s start with a guessing game.

We will show you a photo and you have to guess if the person is a computer scientist or not.

**Slide 4:**

Here’s the first one, he’s riding a unicycle and looks a little nervous.

Do you think he’s a computer scientist?

**Slide 5:**

If you thought yes you are correct.

This is one of my professors.

**Slide 6:**

Here’s another, is she a computer scientist?

What do you think?

**Slide 7:**

Yes she is, but not at Carnegie Mellon, she works at Texas A&M, a big university in (as you might guess)-a city in Texas (Houston).

**Slide 8:**

What about this guy with the cool antique looking car?

**Slide 9:**

He is a computer scientist, he works at Rice University also in Houston, Texas.

**Slide 10:**

Here’s another – is she a computer scientist?

**Slide 11:**

Did we catch you?

She is a professor at CMU but she is not a computer scientist– she’s an astrophysicist

How are doing so far? Did you get them all correct or just a few?

**Slide 12:**

Well what about this woman? What do you think? A bit tricky maybe?

**Slide 13:**

This is supermodel Karlie Kloss --we put her in the yes group because she knows how to code in fact she runs a coding camp for kids.

**Slide 14:**

What about this guy?

Computer scientist, yes or no?

**Slide 15:**

Here’s Chris Bosh, another promoter of coding who goes in our yes group.

Also, quite a well-known basketball player!

**Slide 16:**

Here’s our last one. What do you think?

**Slide 17:**

He’s not a computer scientist– he’s an actor in the show Office Space playing the part of a programmer.

So how did you do?

**Slide 18:**

We’ve seen some computer scientists but what is computer science?

**Slide 19:**

Computer science is all about solving problems.

And we mean all sorts of problems, (give a couple of examples) and try to find the best solutions.

They make software that enables you to search the internet.

They work on security whether it’s for your cell phone or for banks.

**Slide 20:**

When computer scientists solve problems, they often use algorithms– these are step by step ways of working towards a solution.

Let’s try this one.

A farmer has to get a sheep, a carrot and a wolf over the river to the grassy field BUT he can only take one with him at a time …

**Slide 21:**

That sounds easy BUT the farmer’s job is quite complicated.

If the wolf is left alone with the sheep she will eat it!

If the carrot is left alone with the sheep he will eat it.

How can the farmer get them across to the grassy field one at a time without the wolf eating the sheep or the sheep eating the carrot.

**Slide 22:**

Take a little time to think about this.

It might help to have pen and paper to work it out.

In the next slides we will walk you through a solution.

You may have come up with another solution that also works.

**Slide 23:**

First the farmer must take the sheep across the river

**Slide 24:**

The carrot is safe with the wolf who will not eat it.

**Slide 25:**

The farmer then takes the carrot across.

**Slide 26**:

However, she must take the sheep back or else he will eat the carrot if left alone with it!

**Slide 27**:

The farmer then takes the wolf across.

**Slide 28**:

Finally, she can take the sheep across with her! We hoped you enjoyed solving that problem, --we think problem solving can be a lot of fun.

**Slide 29**:

Now let’s think about the kinds of applications we can do with computer science.

**Slide 30**:

We are sure you’ve seen computer animation.

**Slide 31**:

Can you name the films seen here?

Many computer scientists specialize in using computers to animate characters.

Answers:

The top left picture is from *Inside Out*

The top right one is from *Spider-Man: Into the Spider-Verse*

The bottom left picture is from *Finding Nemo*

The bottom right one is *Despicable Me*

**Slide 32:**

Here’s another character

Carnegie Mellon research on soft robotics inspired Disney’s Baymax, a robot hero in the movie Big Hero 6.

**Slide 33:**

Take a few minutes to guess what the most difficult thing for animators to make look real is.

These characters all have it.

If you guessed hair you are correct! Hair is really hard to design realistically.

Do you recognize the characters? What about the movies?

**Slide 34:**

Now let’s look at another application of computer science.

What has computer science to do with the environment?

**Slide 35:**

Imagine you are in a car going for a drive with your family.

You need to make a turn either left or right.

Which turn is the faster to make?

**Slide 36**:

Let’s break it down into steps.

If we go left how may lanes do we have to cross?

We will have to cross three lanes.

**Slide 37**:

Now what if we turn right?

We just have to cross into the right turn lane.

**Slide 38**:

So turning right is faster.

This is not just a fun exercise.

Can you think of someone who needs to make lots of right turns in their daily work?

Have you noticed the steering wheel on some of the US mail trucks is on the right?

They make as many right turns in their route and as few left turns as possible.

This makes them more efficient AND by going right 90% of the time saves 3,000,000 gallons of gas per year

This helps them make as many deliveries as possible.

**Slide 39**:

We are sure you’ve heard the word programming or coding.

We have a fun way for you to think about it.

Do you have your scarf or hat ready?

Do you have a helper (parent brother/sister/ friend)?

**Slide 40**:

Your task is to program the robot to put on a scarf.

You or your helper should be the robot.

You are your helper gives the robot instructions.

The robot can only understand precise instructions.

Also it can only follow one instruction at a time.

Let’s give you an example.

If the instruction is lift the scarf off the table the robot cannot understand.

You would have to say something like this:

Lower your right arm by 90 degrees from your shoulder”

Put your hand on the table.

Move your hand 10 in to the left.

Put your hand on the scarf.

Grip the scarf with your fingers.

Lift your arm by 90 degrees…

…and so on. Wrapping the scarf round the neck is so hard for the robot, so many little instructions.

See how many steps it takes – a lot!!

**Slide 41**:

Robots are everywhere.

They are used to explore planets and go into situations too dangerous for humans.

They do tasks in factories that humans used to do.

They can help doctors with micro surgery and help children with disabilities.

Have you seen the self-driving cars– those are robots.

**Slide 42**:

This slide shows you a guide to how robots work.

They have to sense the environment (this could be with a camera).

Then they use the computer program to plan what they will do.

Then they need to act so they need some way of moving (this could be wheels).

**Slide 43**:

We have a challenge for you.

Can you think of a career than does not involve computer science?

Nowadays there are very few.

**Slide 44**:

So now you know more about computer science let’s give you a few ideas for finding out more.

**Slide 45**:

You might want to ask someone in your family to join you to see these next few slides.

All of these companies and programs can be good starting points.

**Slide 46**:

Look online and find an organization that helps teach you how to build a mobile app.

**Slide 47**:

There are many programs online to help make a website.

**Slide 48:**

These are the cool places where you can work when you study computer science and graduate like Disney or Snapchat.

**Slide 49:**

Thank you for joining our Roadshow online—we hope you’ve had fun and learned a lot.