Schoolhouse Rock

Scooter Computer and Mr. Chips

Introduction

[Scooter:]
When school lets out I race right home
I'm faster than the bus, I just can't wait to see my friend
Who's come to live with us

He's quite unique this friend of mine
Like none you've ever seen
He's full of fancy circuitry
Instead of fingers he has keys
And where a normal face should be he's got a special screen

Scooter Computer and Mr. Chips
They've got the answers at their fingertips
Scooter Computer and Mr. Chips
They've got the answers at their fingertips

[Scooter:]
Mr. Chips is quite a whiz, he works with lightening speed
He gives me information and the answers that I need
He's got a super memory, but I'm what makes him tick
He's programmed so that he reacts when I feed him data
Those are facts, he sorts them out and answers back
You ought to see how quick!

[Mr. Chips:]
Anything you can do with paper and pencil I can do faster

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[Scooter:]
Ok Mr. Chips, let's show
These kids how much we know
I type my questions on his keys to set my pal in motion
Name the states that border on the great Pacific Ocean

He's sure to have the answers if the program all was right
He searches all his data through
And feeds back names of four or two

I knew I could depend on you
Hey Chips, you're out of sight

[Mr. Chips:]
It was nothing

[Scooter:]
There's just no end to what we do with Mr. Chips around
He helps me with my homework so I really get it down
He prints the checks that pay the bills
He stores up dates and names
He files facts, makes shopping lists
He tells us birthdays not to miss
And then on top of all this he's great at playing games

[Mr. Chips:]
I'm free, I win
Sorry

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Software

To have some fun or pass a quiz
Just follow this computer whiz
Scooter Computer and Mr. Chips
They've got the answers at their fingertips

[Scooter:]
Here I am and there you stand, such distance in between
Because I am a human and you are a machine
How can I communicate exactly what I mean
When I am a human and you are a machine

Parlez-vous Francais?
Habla espanol?

[Mr. Chips:]
I am a computer with so much in store
If you could learn my language or I could speak in yours
Then I'd do more work for you than you could ever dream
Though you are a human and I am a machine

[Scooter:]
Ok, I'll give it a try

[Mr. Chips:]
First I hope you'll clear your mind and listen closely, Scooter
Forget the words you thought you knew and start to think computer
Computers change the letters and the numerals humans type
To a number code made up of things that we call bits and bytes

[Scooter:]
Bits and bytes?

[Mr. Chips:]
Think computer, Scooter
A byte is several digits all standing in a row
They help present a letter or a number that you know
For instance when you write an "A"
This byte is what I see
And 00110011 is my way of saying "3"
This bit is one little bit of a byte

[Scooter:]
I get it - bits and bytes are sort of a computer's alphabet

[Mr. Chips:]
That's right, but ABC and 123 isn't talking
Hey, let's face it
That's why one language that we use is called computer BASIC

[Scooter:]
Computer BASIC?

[Mr. Chips:]
"Beginner's All-purpose Symbolic Instruction Code"
BASIC is a language that most computers know,
and once you start to speak it, communications flow.
You use words and phrases - I use bits and bytes
instead, and BASIC lets us understand what the
other one just said.

[Scooter:]
So BASIC is a language that I can talk in human
and you can talk in machine and we can understand
each other.

[Mr. Chips:]
Yes, BASIC is the language you'll be using to feed in
my data. It's also the language all my programs or
software are written in.

[Scooter:]
Data, programs, software?

[Mr. Chips:]
Data is information
Data means the facts
It's everything you store in me
For solving problems back
A program means directions
That tell me what to do
How to analyze my data
And find answers just for you
And Software is just another name
For all the instructions of programs that you feed me

[Scooter:]
Here I am and there you stand, we're closer than we seem
Though I am a human and you are a machine
I'll get a book on BASIC and as quickly as I can
I will talk computer, and you will understand
We didn't do too badly, did we Mr. Chips?

[Mr. Chips:]
It was pretty amazing, Scooter

Hardware

[Scooter:]
I beat you this time Mr. Chips. You're really good at these video games, but I can beat you sometimes.

[Mr. Chips:]
Of course Scooter, because I'm no smarter than the person who programs me. After all, I'm only hardware, just like nuts and bolts.

[Scooter:]
Oh yeah, you're the smartest pack of nuts and bolts I've ever seen . . .

[Mr. Chips:]
Listen, Scooter, some people assume that simply because a computer can gobble up all kinds of numbers and facts and figures and whatever data you happen to feed it, some people assume because a computer knows how to remember instructions and data and whatever it's told, and deliver it back whenever you need it as quick as a wink, some people assume a computer can think.

[Scooter:]
You mean you're not really so smart, Mr. Chips?

[Mr. Chips:]
Right, Scooter. I'm not equipped to be smart. I'm not equipped to think. I'm equipped to use software and process information, not to understand it.

[Scooter:]
What's software?

[Mr. Chips:]
The instructions you decide to give me.

[Scooter:]
And how do you use software?

[Mr. Chips:]
I use software with my hardware. The terminal keyboard you touch when you want to say hi to me, that's hardware. My video screen when I want to reply to you, that's hardware too. And this complicated equipment crammed inside of me, too tiny for you to see, that's hardware too.
Nothing but diodes, capacitors, and resistors
Interconnections and transistors
Jammed together like canned sardines
Thousands of teeny tiny machines
Printed on microscopic strips

Called . . . chips
[Scooter:]
Chips! So that's why they call you . . .

[Mr. Chips:]
Precisely.

[Scooter:]
Gee, Mr. Chips, you have a great brain!

[Mr. Chips:]
Brain? No Scooter, I have no brain. Some people assume that simply because I can beat them at math and war games and chess and checkers, invades and raiders, all in the same afternoon, some people assume because I can shoot off a rocket and chart it and clock it, control and command it and steer it and land it, precisely there on the moon - it's hard to explain, but some people assume I have a brain.

[Scooter:]
Ok, but if you don't have a brain, how can you do so many different things?

[Mr. Chips:]
Because of the different kinds of software people can feed me, scientists or secretaries; astronauts or accountants; managers or musicians; as long as it's put in a language I can understand, I can store the directions in my chips.
I can assure you I haven't a brain and I haven't a heart
And my chips would feel no pain if you took me apart
And I'll never know good from bad, or black from white
And I'll never know happy from sad or wrong from right
I am nothing but diodes, capacitors, and resistors
Interconnections and transistors
Jammed together like canned sardines
Thousands of teeny, tiny machines
Printed on microscopic strips called chips
And it's all hardware just like nuts and bolts

[Scooter:]
You're sure a smooth talker, Mr. Chips.

[Mr. Chips:]
Maybe so Scooter, but you're the brains of the operation.

Number Cruncher

[Scooter:]
Baseball's supposed to be fun!
Can't wait to hit a home run
But they got me playing the wrong position
Since they made me the statistician
I'm in numbers up to my ears!
This is going to take me years and years
And years and years and years

[Mr. Chips:]
Numbers? Scooter, did you say numbers?

[Scooter:]
Yes, numbers, Mr. Chips. Batting averages, earned
run averages, team standings . . . I can probably
figure this stuff out, but I'll miss batting practice.

[Mr. Chips:]
Feed me those numbers. I'll do the work.

[Scooter:]
You mean . . .

[Mr. Chips:]
Precisely!
Sit down Scooter, you're in for a treat
Numbers, you see, are just my meat
Because I'm a number cruncher
A mathematical muncher I can round numbers off
I can square them
I can line numbers up and compare them
I can change them around, rearrange them around
I can deal with them in any way you choose
I'm not a math professor
I am a data processor
I can mix numbers up and combine them
I can take them apart and align them
I can shake numbers up, I can break numbers up
I can turn then into something you can use
If you can punch them
I can crunch them
Because I'm a number cruncher

[Scooter:]
Mr. Chips, you're amazing!

[Mr. Chips:]
Elementary Scooter. A piece of cake. Just feed me
the numbers and I'll process them for you.

[Scooter:]
In other words, I punch them . . .

[Mr. Chips:]
Precisely, and I crunch them.

I process numbers as quick as a flash
For whatever results you need
I process numbers into measuring tools
To measure sound and time and speed
I process numbers to find just how fast
A rocket can get to Mars
I project the future and recall the past
And I can show you a map of the stars

[Scooter:]
Wow!

[Mr. Chips:]
I process numbers into curves and lines
Display them on a graph or chart
I process numbers into colors and shapes
To make a digital work of art!

. . . A work of art!

Because I'm a number cruncher
A mathematical muncher
I can round numbers off, I can square them
I can line numbers up and compare them
I can change then around, rearrange them around
I can deal with them in any way you choose

I'm not a math professor
I am a data processor
I can mix numbers up and combine them
I can take them apart and align them
I can shake numbers up, I can break numbers up
I can turn then into something you can use

[Scooter:]
My baseball statistics?

[Mr. Chips:]
A piece of cake! But remember: First you have to
punch them . . .

[Scooter:]
I know . . . then you can crunch them . . .
Because you're a number cruncher!

[Mr. Chips:]
Precisely.