The evolution of the bicycle

A history lesson

Evolution of the bicycle (MPORA):
https://www.youtube.com/watch?v=E-U02-RWUPc
WHY WAS THE BICYCLE INVENTED?
HOW DID PEOPLE TRAVEL IN THE PAST?
WHAT WERE SOME PROBLEMS ASSOCIATED WITH THESE MODES OF TRANSPORT?

Write down some problems associated with these old modes of transport.

• Walking

• Riding a horse

• Riding a carriage / cart
THE BICYCLE WAS INVENTED AS A SOLUTION TO THESE PROBLEMS!

Did it work? Let’s take a look...
THE FIRST BICYCLE

The vehicle in the picture was invented by Baron Karl von Drais in 1817.

He called it a ‘laufsmachine’, which is German for ‘running machine’. The British called it a draisine, after its inventor.

Why do you think he called it a ‘running machine’? What features can you see on it? What problems did these features solve?
IvP Principle #1: Innovations are ideas that improve on existing solutions

Was the bicycle an improvement over existing solutions?
THE FIRST BICYCLE

The *draisine* solved some problems of transport. The wheels made it easier to move, and the cushions made it more comfortable.

However, it came with its own problems. Can you spot some?
THE FIRST BICYCLE

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It was difficult to use – people had to sit on it and use their feet to push themselves along.

However, it came with its own problems. Can you spot some?
This drawing comes from US Patent No 59,915, filed in 1866.

What has changed?
THE SECOND BICYCLE

This type of bicycle was commonly known as a “boneshaker”.

The pedals made it easier to move.

However, it was very uncomfortable to ride, because the wheels were made out of wood, and the tires were made out of iron.

Hence, the name, “boneshaker”.
THE SECOND BICYCLE

Also, riders soon discovered a new problem.

Do you remember riding such bicycles when you were younger? Were you happy riding it? What problems did you face?

YOU CAN’T GO VERY FAST... 😞
Pause and Reflect

Why was the first bicycle invented?

Why did people try to make improvements to the first bicycle?

What was wrong with the first bicycle?

How did people discover the problems of the first bicycle?
Pause and Reflect

What have we learnt about the process of innovation?
Pause and Reflect

Sometimes, when we invent something to solve a problem, new problems appear!

IvP Principle #2:
A good innovation solves more problems than it creates. A poor innovation creates more problems than it solves.
Pause and Reflect

These new problems tend to only get discovered when people use the innovation.

IvP Principle #3:

The best way to test an innovation is to get people to use it.
THE THIRD BICYCLE

The second bicycle couldn’t travel very fast, because there is a limit to how fast a person could pedal.

So, people invented this bicycle...

Demonstration of early bicycles:
https://www.youtube.com/watch?v=DB9d20n4gkM
THE THIRD BICYCLE

This bicycle is commonly known as the “penny farthing”, because it resembles a large coin (the penny) leading a smaller coin (the farthing).

The large front wheel allowed people to ride faster.

But this created a new problem. Can you spot it?
Innovations are ideas that improve on existing solutions.

The penny-farthing improved the speed of the bicycle, but it also made the bicycle more dangerous to ride.

WAS THE PENNY-FARTHING A GOOD INNOVATION?
CONCLUSION

What have we learned about innovation?

• What is innovation?

• How do you tell the difference between a good innovation and a not-so-good one?

• How do you identify new problems with your innovation and make it even better?
Based on what you have learnt, determine if the following examples are good innovations.
Noodle fan
Head-mounted toilet paper dispenser
Portable handphone charger
The Umbrella Tent!
The refrigerator
Let’s Find a Problem!
Strategy #1: Bug list

One way to come up with problems is to think of things which have annoyed you.

• Reflect:
  When was the last time you felt angry / annoyed / frustrated? What was the cause?

• Act:
  This week, bring a notebook with you wherever you go. Make a note of every time you feel angry or frustrated, or when you see someone else feeling angry or frustrated
Strategy #2: Newspaper Review

One way to come up with problems is to find out what society is struggling with.

• Act:
  Read the newspapers (hardcopy or online). Focus on the ‘Home’ or ‘Singapore’ sections.

• Reflect:
  For each article, think about the problems being faced by the people in the article. Write down these problems in your notebook.