


# Puspa Shrestha

Best Quality Resource Site for Class 11 And 12 Students  
(Based on Updated Curriculum 2077)

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Puspa Shrestha

## Reading

## Hyperloop

***Before you read***

- Do you know the means of transportation shown in the pictures? What are they?
- Do you enjoy travelling at high speed? How do you feel when you travel at high speed?
- What means of transportation do you think we will be using in 50 years' time? What makes you think so?



**Read the following text about an ultra-high-speed ground transportation system called hyperloop and do the given tasks.**

A hyperloop, as you may have heard, is an ultra-high-speed ground transportation system for passenger and cargo. It could see freight and passengers travelling as high as 760mph (1,220 km/h), in a 'floating' pod which shoots through giant, low-pressure tubes, either above or below ground. It is a newer form of transport, currently being explored and developed by a number of companies. A hyperloop technology is still in development even though the basic concept has been around for many years. The earliest hyperloop was likely to be up and running by 2020 but most services are expected to be later, as trials of the technology are still in their early stages.



There are two big differences between hyperloop and traditional rail. Firstly, the pods carrying passengers travel through tubes or tunnels from which most of the air has been removed to reduce friction. This should allow the pods to travel at up to 760 miles per hour. Secondly, rather than using wheels like a train or car, the pods are designed

to float on air skis, using the same basic idea as an air hockey table, or use magnetic **levitation** to reduce friction.

A hyperloop could be cheaper and faster than train or car travel, and cheaper and less polluting than air travel. It is also quicker and cheaper to build than traditional high-speed rail. A hyperloop could therefore be used to take the pressure off **gridlocked** roads, making travel between cities easier, and potentially unlocking major economic benefits as a result.

### What is the history of a hyperloop?

The idea of using low-pressure or vacuum tubes as part of a transport system has a long heritage. The Crystal Palace Pneumatic Railway used air pressure to push a wagon uphill (and a vacuum to drag it back down) way back in Victorian south London in 1864. Similar systems using pneumatic tubes to send mail and packages between buildings have been in use since the late nineteenth century, and can still be seen in supermarkets and banks to move money around today.

One clear predecessor of the hyperloop is the 'vactrain' concept developed by Robert Goddard early in the twentieth century; since then, many similar ideas have been proposed without much success.

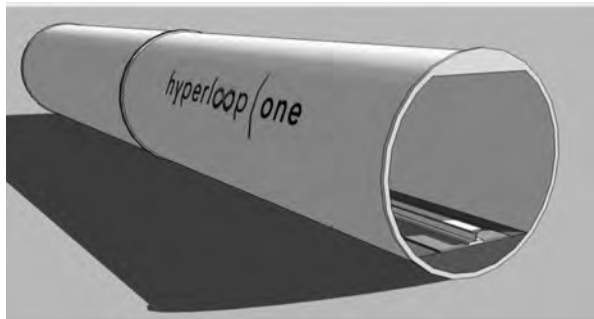
However, it was entrepreneur Elon Musk who really reignited interest in the concept with his 'Hyperloop Alpha' paper in August 2013, which set out how a modern system would work and how much it would cost.

### How does a hyperloop tube work?

The basic idea of hyperloop as **envisioned** by Musk is that the passenger pods or capsules travel through a tube, either above or below ground. To reduce friction, most but not all of the air is removed from the tubes by pumps.

Overcoming air resistance is one of the biggest uses of energy in high speed travel. Airliners climb to high altitudes to travel through less dense air; in order to create a similar effect at ground level, hyperloop encloses the capsules in a reduced-pressure tube, effectively allowing the trains to travel at airplane speeds while still on the ground.

In Musk's model, the pressure of the air inside the hyperloop tube is about one-sixth the pressure of the atmosphere on Mars (a notable comparison as Mars is another of Musk's interests). This means an operating pressure of 100 pascals, which reduces the drag force of the air by 1,000 times relative to sea level conditions, and would be **equivalent** to flying above 150,000 feet.



## How do hyperloop capsules work?

The hyperloop capsules in Musk's model float above the tube's surface on a set of 28 air-bearing skis, similar to the way that the puck floats just above the table on an air hockey game. One major difference is that it is the pod, not the track, which generates the air cushion in order to keep the tube as simple and cheap as possible. Other versions of hyperloop use magnetic levitation rather than air skis to keep the passenger pods above the tracks.



The pod would get its initial velocity from an external linear electric motor, which would accelerate it to 'high **subsonic** velocity' and then give it a boost every 70 miles or so; in between, the pod would coast along in near vacuum. Each capsule could carry 28 passengers (other versions aim to carry up to 40) plus some luggage; another version of the pods could carry cargo and vehicles. Pods would depart every two minutes (or every 30 seconds at peak usage).

## How would a hyperloop be powered?

The pods will get their velocity from an external linear electric motor-effectively a round induction motor (like the one in the Tesla Model S) rolled flat. Under Musk's model, the Hyperloop would be powered by solar panels placed on the top of the tube which would allow the system to generate more energy than it needs to run.

## What will it feel like to travel in a hyperloop?

Critics of hyperloop have warned that travelling in the tube might be an uncomfortable experience, due to nausea-inducing acceleration, plus lateral G-force on bends in the route. However, Virgin Hyperloop One says that a journey via hyperloop will feel about the same as riding in an elevator or a passenger plane.

"Although a hyperloop will be fast, the systems we are building will accelerate with the same tolerable G-forces as that of taking off in a Boeing 747," it said. Acceleration and deceleration will be gradual, it added, with no G-forces and turbulence.

Travelling in a concrete pipe in a windowless pod means there isn't going to be much to look at; Musk's original vision said that "beautiful landscape will be displayed in the cabin" and each passenger will have access to their own personal entertainment system.

## Will a hyperloop be a success?

That's the huge, multibillion dollar and, as yet, unanswered question. The concept has been around for a long time, but until now the technology has been lacking. This time

around, it's possible that the technology may have just caught up with the concept. There are well-funded companies racing to be the first to deliver a working service but, despite their optimistic timescales, these projects are still very much in the pilot and experimental stages. Going from short test routes to hundreds of kilometres of track is a big jump that none of these firms has made yet.

If the technology is still in development, that's also very true of the business models to support it. The success of hyperloop will vary depending on the destinations, local economics, and geography. Trying to build a new line overland across England, for example, can prove an expensive and complicated business which can take many years (as the ongoing HS2 controversy has shown). In other countries where land is cheaper or where routes can travel through less populated areas, it may be easier to get services up and running faster.

Capacity is another issue. It's not clear that hyperloop can do a better job of moving a large number of people than other mass transit options. Critics argue that lots of pods will be required to achieve the same passenger numbers as more traditional rail, which uses much bigger carriages. And there are many engineering hurdles to overcome, like building the tubes strong enough to deal with the stresses of carrying the high-speed pods, and finding energy- and cost- efficient ways to keep them operating at low pressure.

Moving from a successful test to a full commercial deployment is a big jump, and passenger trials are still to come. Assuming that consumers are happy being zoomed around in these tubes, finding the right price for the service will be vital, too.

Right now hyperloop is at an experimental stage, even if the companies involved are very keen to talk about its potential.

### ***Working with words***

**A. Choose the correct words from the box to complete the following sentences.**

freight	levitation	gridlock	pneumatic	predecessor
envisioned	equivalent	subsonic	turbulence	deceleration

- I think that covering up the facts is ..... to lying really.
- If there is not a substantial move to public transport, we will have ..... and the whole regeneration will not work.
- Each new leader would blame his ..... for all the evils of the past.
- We have, in fact, ..... a better world and have made it happen.
- The main linear actuators of the ..... systems are cylinders.

- f. The barrel was short and the bullet emerged at ..... speed.
- g. The city is said to receive two-fifths of the total ..... delivered in the country.
- h. It would still take four hours to get down, in a spiral of .....
- i. Apparently, the magician will be doing some ..... on the stage tomorrow.
- j. We might be experiencing some ..... on this flight due to an approaching electrical storm.

**B. Add three more words that are formed with the following prefixes.**

- a. hyper- : hyperloop, ....., ....., .....
- b. ultra- : ultrahigh, ....., ....., .....
- c. up- : uphill, ....., ....., .....
- d. over- : overcoming, ....., ....., .....
- e. multi- : multibillion, ....., ....., .....

## Comprehension

**Answer the following questions.**

- a. What is a hyperloop? How does it work?
- b. How is hyperloop more beneficial than the traditional trains?
- c. Does hyperloop have a successful history? How?
- d. Write the contributions of Robert Goddard and Elon Musk for the development of hyperloop.
- e. What relation does speed have with air resistance? Explain.
- f. What are hyperloop capsules compared with? How are they similar?
- g. How do the passengers feel while travelling via hyperloop? What will be done to make it luxurious?
- h. Why does the writer doubt about the success of hyperloop? What does the success depend on?

## Critical thinking

- a. Is the hyperloop the future of transportation or just a dream? What do you think? Justify your opinion with suitable reasons.
- b. The number of private vehicles is increasing day by day in Nepal beyond the capacity of our infrastructure. What do you think should be done to curb the ever-growing number of private vehicles? Discuss.

## Writing

- A. Read the press release issued by Bahamasair about their irregular operations.



### PRESS RELEASE

**RE: IRREGULAR OPERATIONS JULY 7, 2019 – NASSAU/ORLANDO**  
**ISSUED: Monday – July 08, 2019**

**NASSAU, BAHAMAS:** Bahamasair wishes to advise the travelling public that our Sunday, July 7 schedule was negatively impacted by weather related closures at both the Lynden Pindling and Orlando International Airports.

Unfortunately, the Lynden Pindling International Airport closed several times yesterday due to thunder and lightning storms which lingered around the island of New Providence for most of the day creating a number of delays. Further compounding these challenges was the closure of the Orlando International Airport due to lightning which further impacted the schedule and ultimately resulted in one of our Orlando bound flights having to be diverted to Fort Lauderdale.

With the passage of these weather systems, it is expected that all flights today should proceed as scheduled with minimal disruption.

We wish to thank the traveling public for their continued patience, as these delays were unavoidable. Our intent is to consistently provide a safe and dependable service as we strive to be the airline of choice connecting the islands of The Bahamas to the world.

Tracy J. Cooper  
Managing Director

- B. Suppose you are the General Manager of Nepal Airlines. Issue a press release on behalf of the airlines about the cancellation of flights to the mountain regions due to the poor weather condition.

## Grammar

### Subject verb agreement

- A. Study the following examples.

- Neither** she **nor** I *am* guilty.
- I am not sure **whether** you **or** he *has* created the trouble.
- Either** the students **or** their English teacher *is* responsible for the misinformation.
- Neither** boiling of water with the express purpose of destroying bacteria and other parasites **nor** other purification methods *were* employed in Western civilizations.



**B. Rewrite the following sentences with the correct form of the verbs in the brackets.**

- a. The invitation is for one person. I don't mind whether you or she (come) to the party.
- b. Neither the MPs nor the Prime Minister (have) felt regret for the party split.
- c. I don't care whether he or she (win) the lottery.
- d. Either the Kantipur or the Republica (be) used for the advertisement.
- e. She speaks in a strange accent. Neither I nor my sister (understand) her.
- f. I forgot whether the singers or the actress (be) given the Film Fair Award last year.
- g. Neither the tracksuit nor the pajamas (fit) me perfectly.
- h. Neither the gas fire nor the electric heaters (be) suitable for room heating.

**C. This passage contains the agreement errors. Correct the subjects or verbs that don't agree with each other. Remember to use present tense in your corrections.**

Within the state of Arizona, Rob, along with his family, move frequently, from city to city. After his arrival, one of his first tasks are to find an apartment close to work as he do not have a car. Usually, there is many different places to choose from, and he consider cost, location, and luxury. If one apartment has a washing machine and dryer and cost four hundred dollars a month, he prefer to rent it over another apartment which have significantly less rent located two blocks from a Laundromat. Rob's family never wants to live in an apartment on the thirteenth floor since all of them fears heights. He also try to choose an apartment with landlords recommended by former tenants. Everybody know that it is important to find a responsible landlord. Rob and his wife loves to cook together when both is free, so he need a spacious, well-equipped kitchen. Rob often also look for a place with an air conditioner because there is so many scorching days and nights in Arizona. Whenever Rob find a new apartment, all of his concerns disappears. He feel relieved and call his mother. Someone understands!

## Listening

**A. Observe the pictures and answer the questions.**

- a. What technology is shown in the picture?
- b. Who is the man in the picture? Where is he? Where is he travelling to?





**B. Listen to the news report about space exploration and state whether the following statements are *True* or *False*.**

- a. Cosmologists doubt that 2021 will be a great year for space exploration.
- b. The reporter says science fiction is turning out to be real life.
- c. The news says we will be surprised by human beings colonising Mars.
- d. Q-PACE, a NASA probe, will study the collision of small particles.
- e. NASA said scientists had the samples of Mars for a long time.
- f. The Hubble Telescope will re-launch in October.

**C. Listen to the audio again and complete these sentences.**

- a. Commercial companies want to .....into heavens through technology.
- b. Elon Musk and Richard Branson are setting their sights on .....
- c. A new form of holidays can be .....to the moon.
- d. Rover will test for signs of possible .....
- e. The mission of launching James Webb Space Telescope is to .....the first galaxies.

**D. What do you know about space tourism? Talk to your friends.**

## Speaking

### Summarising

**A. Read and act out the following conversation.**



Anita has invited me to her birthday party next Sunday. But, I'll be in my village with my parents that day.

She has invited me, too. And, I'll be in a meeting in Pokhara.

I'm also busy that day. **In other words,** none of us can go.

**B. Respond to the situations below as in the example. You can use the expressions in the box to summarise.**

In other words, ... Basically, ... What I'm saying is, ... In a nutshell, ...  
The point I'm making is, ... In short, ... To sum up, ... To summarise, ...

**Example:** You want to know from someone about the best way to travel from Kathmandu to Pokhara. You want to do it cheaply.

A: *How can I travel cheaply from Kathmandu to Pokhara?*

B: *The plane is too expensive. Perhaps you could go by bus. Or, cheaper still hitch-hike. On the other hand, the most convenient way is to hire a car. But, then that's expensive, too.*

C: *To sum up, whether you hitch-hike or go by bus.*

- a. You want your friends to tell you how to throw a dart in a game of darts.
  - b. You want to know from your friends about their meeting with the principal regarding the school picnic.
  - c. Your sister is receiving treatment in hospital. You want the hospital staff to tell you about her condition.
  - d. Your bike is out of order. You want to know from the mechanics what actually has happened.
  - e. You missed a class and thus want to know about the assignment from your friends.
- C. You are going to conclude a speech on the need of modern technology in Nepal. How do you actually sum up your speech?**

### **Project work**

People have been using different technologies for a long to make their works easy. In our communities too, people used many traditional technologies which are no longer in practice. Meet some elderly people in your community and ask them about such technologies. Write a report and share it to the class.