This is a transcript of the video “Aerodynamics ~ STEAM Education from Queensland”
While you are watching the video, you can use this transcript for your better understanding of the contents.

Introduction by Tina (the navigator)

0:09

Hello, everyone! I’m Tina and I’m the navigator for today’s session. I usually work at TGG.
Today’s session is about aerodynamics. Have you ever heard of aerodynamics? It is the study of how air interacts with objects. For example, when an airplane flies upward, air hits the wings, and the air and plane are both affected. You can fly using the air that hits your wings. Aerodynamics is the study of such movements of air.
Let’s join an aerodynamics class in Queensland! In the class, students do some experiments by themselves. Let’s get paper and scissors and do an experiment together. It will be very interesting.

As a warm-up before the class, I’ll introduce a few words here. All of these are important expressions for understanding today’s themes.

gravity, you try
gravity
Gravity is the force that makes things fall.

air particle, you try
air particle
Air particles push a falling object upward to create lift.

altitude, you try
altitude
The force causes the tumblewing to increase altitude.

OK. Now you’re ready!
Let’s experience the seminar class in Queensland together!

Join the classroom in Queensland

02:21

Welcome to Queensland.

In Queensland, my learners call me Mr. Porter.

I'm a Queensland teacher from the sunshine coast.

I live near the beach and I like to go surfing and play soccer.

So today we've got three Queensland rules.

The first rule I'd like everyone to read aloud.

Can you say loud after me?

Three, two, one.

Loud.

Not too bad.

I think we can do a little bit better.

Let's have a practice.

Okay, everyone, let's try it again.

Three, two, one.

Loud.

Well done, makes me feel at home.

Also learners ask lots of questions.

So we ask questions together, to our agents, and to our teachers.

Teamwork is really important.

We have many fun activities today.

So please, when the teacher is talking, have everything out of your hands.

Eyes watching and ears listening.

Okay, our mission.

Today's learning goal is to, number one, understand why things fall.

And we're going to have an inquiry into making something that falls as slow as possible.

We need to learn important science words in English today.

So the first one is gravity.

Please say after me, gravity.

Gravity.

Well done.

Force.

Force.

We can have a pull force, or we can also have a push force.

Short quiz.

With your partner please discuss, and see how many push or pull forces you can see.

You have 10 seconds.

(Students discussing)

Kangaroos.

What do you think this force is?

Pull.

Well done.

Uh, koalas.

What about this force?

Push.

Push.

What do you think this force is?

Pull.

Hm, we'll investigate in the next slides.

Why do things fall?

Have a short discussion with your partner.

Why do things fall?

Is it a force?

What do you think?

Why do things fall?

04:55

Here, the lecturer has asked us a question.

Why do things fall?

Let's consider this question together.

What is your opinion? Here, we'll go back to the session.

I heard gravity over here, well done.

So let's read together.

Gravity is the force that makes things fall.

So gravity pulls the object towards Earth.

Okay today's mission.

Now you understand why things fall.

Number two.

We're going to make something that falls as slow as possible.

As slow as possible.

So, some more important words for our game.

We have lift.

Weight, which is a pull.

Gravity pulls the weight.

Thrust, just like power, and drag.

Repeat after me, lift.

Lift.

Weight.

Weight.

Thrust.

Thrust.

And drag.

Drag.

More words in English.

Air particles.

So when we breathe in and out, there is air particles all in the air.

Air particles.

Air particles.

Well done.

Lift.

Lift.

So that's the opposite force to gravity.

It's that push force.

Weight.

Weight.

Good.

Pull, the gravity pulls the weight towards Earth.

And this one is quite a large word.

Thrust.

Thrust.

So if we have a big balloon, we have lots of thrust.

And a little balloon, little thrust.

So our inquiry today is to ask ourselves why do things fall?

Let's read together.

Fast or slow.

So we're going to think about the forces.

This group over here, the kangaroos.

What do you think this could be?

Something pulls objects towards the earth.

What pulls the objects towards the earth?

Gravity.

Gravity.

Well done.

And koalas.

Air particles push up and cause...

Lift.

Ah, well done.

Expert learners today.

Okay, now we're going to test some helicopters.

So at your desk, you will have three different designs.

You have a small helicopter,

a helicopter with long blades,

and a helicopter with short blades.

You also have two weights.

You have a small weight, or paper clip,

and a large weight.

So our inquiry.

Read together.

Make something that falls as slow as possible.

So, using your weight and your helicopter, test with your partner.

Remember teamwork and taking turns.

You have five minutes.

Off you go.

The experiment with helicopters

08:43

Here, the experiment with helicopters begins.
Let's join in this experiment.
Make two types of helicopters by cutting shapes out of the helicopter template sheet and attaching two types of paper clips, small ones and large ones, as weights.
Let's get started and test our helicopters.

How was your experiment? Which helicopter fell slowly?
Here, we'll go back to the session and listen to the opinions of other attendees.

Okay, kangaroos, can you please hold up your design?

And show us what you've labeled on your diagram.

So what have you drawn on your diagram?

We drew the long blade helicopter.

Excellent.

We drew air particles in the small weight.

And I can see you've got the push and the pull force.

Well done.

Can you please hold up your diagram?

Excellent.

I can also see the push and the pull force.

And you've used lots of the English words down the bottom.

And this group.

I like how you've included the spin there too.

Well done.

Okay.

On the back of your boards you have some questions.

Before you start, we'll read through together.

Okay.

Our helicopter had a fast or slow fall because...

So you can use keywords down the bottom to help you.

Number two, our helicopter had a fast or slow spin.

A fast spin is good because it creates extra...

big science word from earlier...

that also gives extra something to a helicopter.

Okay, so take turns with your partners.

A different person writing for each one.

(Students writing)

Okay, looks like everyone is almost finished.

Dolphins, over here.

Number one.

Our helicopter had a...

Slow.

Slow fall because?

There were more air particles under the helicopter blade.

Excellent.

What were the air particles doing?

Pushing up.

Yeah, fantastic.

And number two?

Koalas.

Our helicopter had a...

Fast.

Fast spin.

A fast spin is good because it creates extra?

Thrust.

Well done.

So thrust is like power that gives extra...

Lift.

Lift to a helicopter.

So you've basically made a propeller.

The faster it goes or spins, the more lift it has.

Okay, why does it fall slowly?

As we said, gravity pulls the weight towards the earth.

And the blades, they, they catch many air particles.

The spin causes the propeller to lift, which opposes the weight of the propeller.

The more air particles there are, the faster the spin, and the more lift.

You will get be given some paper, scissors and tape.

And you're going to try and make an object fall as slowly as possible.

Before we start, we're going to look at some questions that we can investigate.

So, our inquiry.

Make something that falls as slow as possible.

We can use the question words as sentence starters to help us look at what we're

going to investigate.

Make something that falls as slow as possible

13:02

Here, the lecturer mentioned an important suggestion.

Make something that falls as slow as possible.
We can use the question words as sentence starters to help us look at what we're going to investigate.

Let's think together about what questions we can ask to help us to make something that falls as slow as possible.

What is your question?
Here, we'll go back to the session and listen to the opinions of other attendees.

I've done one for you.

How can we increase lift?

So the more lift, the slower it will fall because it opposes the weight.

So with your partners, using your whiteboards and your whiteboard markers, what other questions can you investigate today?

Try and come up with at least two questions each.

Off you go.

(Students thinking)

Okay, it looks like this group over here is finished.

So what questions did you come up with?

How can we reduce weight?

Excellent.

And how can we increase spin?

Nice.

So, given that extra power.

Any different questions over here that you're going to investigate?

How to increase air particles?

Well done.

And over here, what size should we make it?

Ah so you're thinking a bigger or a smaller object?

Bigger.

Why a bigger one?

Because more air particles will catch underneath.

Ah, well done.

Now you can use each other's questions.

Here are some of the ones that we've just discussed.

How can we reduce weight?

What size, well done, should we use?

Or what design could increase thrust?

You've got five minutes.

In your packs, you have paper, scissors and tape.

Please leave the helicopters to the side and start when you're ready.

the experiment to make something that falls as slow as possible

15:48

Here, the second experiment, to make something that falls as slow as possible, begins.
Let's join in the experiment.
Make an object using paper, scissors and sticky tape, and test the object.

How was your experiment? How long did your object stay in the air?
Here, we'll go back to the session and watch the experiments of other attendees.

So, well done, I see some great designs.

We're going to now test what you've made.

So, one person from each group, please stand up with your object.

And we'll test all together at the same time.

So move back a little bit.

Find the space.

And remember, counting in English, to see if it falls slow or fast.

Okay, ready, I'll count you down from three, two, one, go.

One, two, three.

Well done.

Okay, come back and join us.

Did any design stay in the air for over 10 seconds?

No.

Do you believe it's possible to make a design to stay in the air for longer than 10 seconds?

Quite a long time.

I've got some tape, scissors and some paper.

I'll just quickly see if I can make a design.

Ah, finished.

Okay, so please spin around and help count in English to see how long.

One, two, three, four, five, six, seven, eight, nine, 10, 11, 12, 13, 14, 15, 16.

Done.

Okay, so this is called tumblewing.

Why does it fly?

So the tumblewing uses air particles pushing up over against the board which creates extra spin for our tumblewing.

So some extra science words today.

We can increase altitude.

Increase.

Increase.

And decrease.

Decrease.

Well done.

If we walk slow with our board, we will have less air particles.

It will cause our tumblewing to decrease altitude.

But if we walk fast, what's going to happen?

We'll have more air particles and it will cause the tumblewing to increase altitude.

So the tumblewing, we have the downward front wing facing towards the ground away from us.

The wing close to us is pointing towards the roof.

The side wings need to be straight up, 90 degrees.

And if you can drop, drop for your partner, and flick it back a little bit.

Okay, so we've got dolphins, can you please use the space at the back with your

agent?

Kangaroos, space at the back with your agent.

And, koalas, at the front.

Make sure you take it in turns, teamwork, helping each other drop the tumblewings.

The experiment with tumblewings

19:58

Here, the experiment with tumblewings begins.
Let's join in the experiment.
Make a tumblewing by cutting shapes out of the tumblewing template sheet, and test-fly the tumblewing with a board.

How was your experiment? How long did your tumblewing fly for?
Here, we'll go back to the session and watch the other attendees' experiments.

These diagrams are going to help you.

Reflection on the tumblewings.

Let's read together.

When we walked fast, the tumblewing increased or decreased altitude because why?

When we walked slow the tumblewing increased or decreased altitude because why?

Also, science words down the bottom to help you.

And draw a diagram showing the forces with your tumblewing.

Please take turns for the writing.

Different person writing each time.

(Students writing)

Okay koalas, number one when we walked fast the tumblewing...

Increased.

Increased altitude because...

More air particles were underneath.

More air particles were underneath the tumblewing.

And what did it do?

It lifted it.

Okay.

Kangaroos, number two, kangaroos.

When we walk slow the tumblewing...

Decreased.

Decreased altitude because...

Less air particles were hitting the tumblewing.

And this group over here.

You are dolphins, can you hold up your design?

Show me your diagram.

I can see lift, spin, and air particles.

Well done.

Okay, reflections.

On the other side of your whiteboard, we're going to reflect on what English words we can remember from today.

So today's mission, hands, eyes, ears.

Today's mission number one, understand why things fall.

Number two, make something that falls as slow as possible.

As a team, what science English words can you remember from the lesson today?

Make your own list with your group.

Off you go.

Many words over here, well done.

(Students writing)

Ten, nine, eight, seven

Six, five...

Three, two, one, stop.

Okay, count how many words you found today.

One, two, three...

Twelve.

Very impressive, well done, everyone.

Okay, thank you for visiting Queensland.

We hope you enjoyed your time with the lesson today and you'd like to visit again in the future.

Closing by Tina (the navigator)

25:08

Well, how was today's session?
Various experiments have been conducted to find out why objects fall and how to slow down the speed at which objects fall. They were interesting experiments. The simple tumblewing made of paper did not fall easily. Its fall created a force that caused air particles to lift it up. I think you learned the process of experimenting and making theories from the results.
At the beginning of the class, the teacher emphasized two points: "Learners ask a lot of questions." and "Teamwork is important." I felt once again that advances in science begin with questions. And I thought that working as a team would help me learn more than I would by myself.
I think you learned a lot from today's lecture. It will surely be useful for future studies and work. Well done! See you again!