



Prize Winner

Scientific Inquiry

Year R-2

Daniel Boucher

**St Peter's Woodlands Grammar
School**



Biodegrade-able?

By Daniel Boucher (Year 2)

Questioning and Predicting

I have noticed that in the supermarket lots of wipes say “biodegradable” and “compostable”. I really like reading packets and my mum uses a lot of baby wipes on my brother so I had some questions.

Biodegradable or compostable wipes are better for the environment because they break down in nature, plastic wipes release micro plastics, that can get into our water and we can drink it. Animals, birds and fish can eat it too and it can affect plant growth.

Landfill and dumps are bad because the waste breaks down into toxic substances that pollute the environment. Compostable waste is better because it can break down naturally and you can use compost on your garden.

FUN FACT!!!
People eat and drink up to 5 grams of plastic per day.

Aims:

- 1: To find out if the wipes are biodegradable at all
- 2: To see which brand biodegrades first
- 3: To see how “biodegradable” wipes break down compared to toilet paper and plastic based wipes

Hypothesis:

I think that the toilet paper control will biodegrade first.

I think that out of the biodegradable wipes, the Bunjie wipe will biodegrade the best because of the way it feels. It feels thin.

I think the Babyboo plastic control will not biodegrade because it is made of plastic, and plastic is not biodegradable.

Planning and Conducting

Materials:

- Wipes from 5 biodegradable wipe brands, 1 plastic wipe brand, toilet paper
- 7 wooden skewers
- 7 pieces of tape
- Permanent marker
- Garden bed
- Shovel and gardening fork

Method:

1. Inspect each packet of wipes and write down the advertising about biodegradability and the materials that each wipe is made of
2. Write each brand name on a piece of tape.
3. Attach each piece to a skewer.
4. Dig a 15 cm deep hole in the garden, 50cm by 50cm in size



5. Place the wipes into the hole (spread out)
6. Cover it up with soil again
7. Wait 4 weeks and then dig it up and see the changes




This is how it looked when I was finished.




Information Gathering

I read and recorded the information on each packet of wipes.

Words on the packaging I didn't know:

- Viscose: man-made from regenerated cellulose
- FSC: Forestry Stewardship Council is a certificate products have which uses responsible tree harvesting, protects plants, animals and people
- OEKO-TEX: a certification that shows that the product has been tested for harmful chemicals, protects workers
- ASTM D5511: a test to see if something biodegrades in a landfill (anaerobic environment - no oxygen).

Brand	Advertising	Material
Biodegradable Wipes		
Goat 	Biodegradable Plastic free Compostable	Soft viscose
Rascal+friends H2O wipes 	Biodegradable* Biodegradability tested in accordance with ISO 14855-1:2012	Plant based fibres
WaterWipes 	100% biodegradable wipes 100% plant-based wipes Will biodegrade in 12 weeks	Renewable plant fibres
Cub Lightly scented biodegradable^ baby wipes 	Green packaging Biodegradable ^Tested according to ASTM D5511 to biodegrade in standard landfill conditions FSC supporting responsible forestry	FSC Mix - mixture of materials from FSC certified forests, recycled materials and/or FSC-controlled wood

Brand	Advertising	Material
<p>Bunjie</p> 	<p>100% compostable Biodegradable Plant based All natural, no nasties</p>	<p>OEKO-TEX and FSC certified plant based fibres</p>
<p>Controls</p>		
<p>Plastic based wipe BabyBoo</p> 	<p>No environmental information advertised</p>	<p>Not listed</p>
<p>Standard toilet paper Aldi Confidence</p> 	<p>Pulp sourced from sustainable plantations</p>	<p>FSC Mix - mixture of materials from FSC certified forests, recycled materials and/or FSC-controlled wood</p>

Processing and Analysing Data and Information

Results:

I carefully dug up each wipe, making sure not to disturb it too much.



Brand	Advertising/Material	Results	Ranking (best to least biodegradable)
Biodegradable Wipes			
Bunjie	100% compostable Biodegradable Plant based fibres	20% left	1
Rascal+friends H2O wipes	Biodegradable Plant based fibres	Still is a bit wet	2
Goat	Biodegradable/ Compostable Soft viscose	Earth worm in it	3
Cub Lightly scented biodegradable^ baby wipes	Biodegradable Wood materials	It was breaking down	4
WaterWipes	100% biodegradable wipes 100% plant-based Will biodegrade in 12 weeks Plant fibres	80-90% left	5
Controls			
Plastic based wipe BabyBoo	No environmental information advertised Unknown material	No change	
Standard toilet paper Aldi Confidence	Pulp sourced from sustainable plantations	One tiny bit left	

Evaluating

I found that BabyBoo plastic control did not biodegrade at all. If people use those wipes it just makes landfill bigger and worse. The toilet paper control almost fully biodegraded. I wasn't surprised at all to see how much the biodegradable wipes had broken down, because they are made from plant fibres. The wipe that biodegraded the fastest in our garden was Bunjie, and the slowest biodegradable wipe was WaterWipes.

I hope people learn from my research not to use non-biodegradable or plastic wipes. I think my mum should buy Bunjie wipes or use Confidence toilet paper to wipe the baby's bottom. I think it is best not to put the wipes into plastic nappy bags because it won't be able to biodegrade, because it won't be able to reach any soil. I am thinking about messaging the BabyBoo company to ask them not to make plastic wipes.

I think my experiment worked well, and next time I would start earlier so that the wipes would have longer to biodegrade. Next time, I will investigate and test disinfectant wipes.

Word count - 631 words

References

<https://fsc.org/en/what-the-fsc-labels-mean>

<https://www.oeko-tex.com/en/news/blog/what-oeko-tex-labels-mean-and-why-they-matter>

[https://www.watsongloves.com/astm-d5511-astm-d5526/#:~:text=The%20ASTM%20D5511%20test%20is,typically%2030%20days%20for%20testing\).](https://www.watsongloves.com/astm-d5511-astm-d5526/#:~:text=The%20ASTM%20D5511%20test%20is,typically%2030%20days%20for%20testing).)

Pollution in Australia By Peter Turner

<https://environmentvictoria.org.au/resource/problem-landfill/>

Thank you to my Mum for helping me to use the computer.

Biodegrade-able?

Log Book

By Daniel Boucher




Saturday 18th May





I went to the supermarket with my Dad. We picked out all the wipes that were biodegradable, plus one plastic wipe. We also chose toilet paper.



These are the wipes we chose. I thought about looking at them under my microscope, but thought that getting water and dirt in the microscope would break it.

I read all the packets to find out what advertising they had about biodegradability or compostability, and what they were made of. Then my Mum helped me to make a table to write it down into on the computer.

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I think that Bunjie will break down the fastest because it is thinnest. I don't think the plastic wipe will breakdown at all.

Sunday 19th May

Today we started the experiment. I picked this spot because it is filled with soil and has enough space to dig. It is shaded by a plum tree.



Sunday 26th May

The experiment has not been disturbed. The labels are still visible. The weather has been cool and dry this week.

Sunday 9th June

The tree has dropped a lot of leaves and now there is a thick layer over the experiment, but I can still see the labels. There has been rain this week and the ground is damp. The labels are still on the sticks, and I think the wipes will still be ok.

Sunday 23rd July

Today we dug up the wipes and looked at what had happened. I wrote this down in a table. It was very exciting to see the results.

toilet paper control ① 1 tiny bit left	water wipe ② so 90% left	Baby Boo no change control ② not good.
CUB ④ it was breaking down	Got 3rd earth worm in it ③	⑤ Rascal and friends still is a bit wet
Bunjie ⑥ 20% left		



OSA RISK ASSESSMENT FORM

for all entries in (✓) Models & Inventions and Scientific Inquiry

This must be included with your report, log book or entry. One form per entry.

STUDENT(S) NAME: Daniel Boucher ID: 0683-010

SCHOOL: St Peters Woodlands Grammar School

Activity: Give a brief outline of what you are planning to do.

I will dig a hole in garden.

Then I will bury the baby wipes

Then I will wait for 4 weeks, then dig them up and examine them.

Are there possible risks? Consider the following:

- Chemical risks: Are you using chemicals? If so, check with your teacher that any chemicals to be used are on the approved list for schools. Check the safety requirements for their use, such as eye protection and eyewash facilities, availability of running water, use of gloves, a well-ventilated area or fume cupboard.
- Thermal risks: Are you heating things? Could you be burnt?
- Biological risks: Are you working with micro-organisms such as mould and bacteria?
- Sharps risks: Are you cutting things, and is there a risk of injury from sharp objects?
- Electrical risks: Are you using mains (240 volt) electricity? How will you make sure that this is safe? Could you use a battery instead?
- Radiation risks: Does your entry use potentially harmful radiation such as UV or lasers?
- Other hazards.

Also, if you are using other people as subjects in an investigation you must get them to sign a note consenting to be part of your experiment.

Risks	How I will control/manage the risk
No big hazards or risks identified I am working with soil which can have bacteria in it that can make us sick	I will wear gloves and wash my hands after digging in the garden and handling the wipes Text

(Attach another sheet if needed.)

Risk Assessment indicates that this activity can be safely carried out

RISK ASSESSMENT COMPLETED BY (student name(s)): Daniel Boucher

SIGNATURE(S): [Signature]

By ticking this box, I/we state that my/our project adheres to the listed criteria for this Category.

TEACHER'S NAME: David Kennedy

SIGNATURE: [Signature] DATE: 26.6.2024