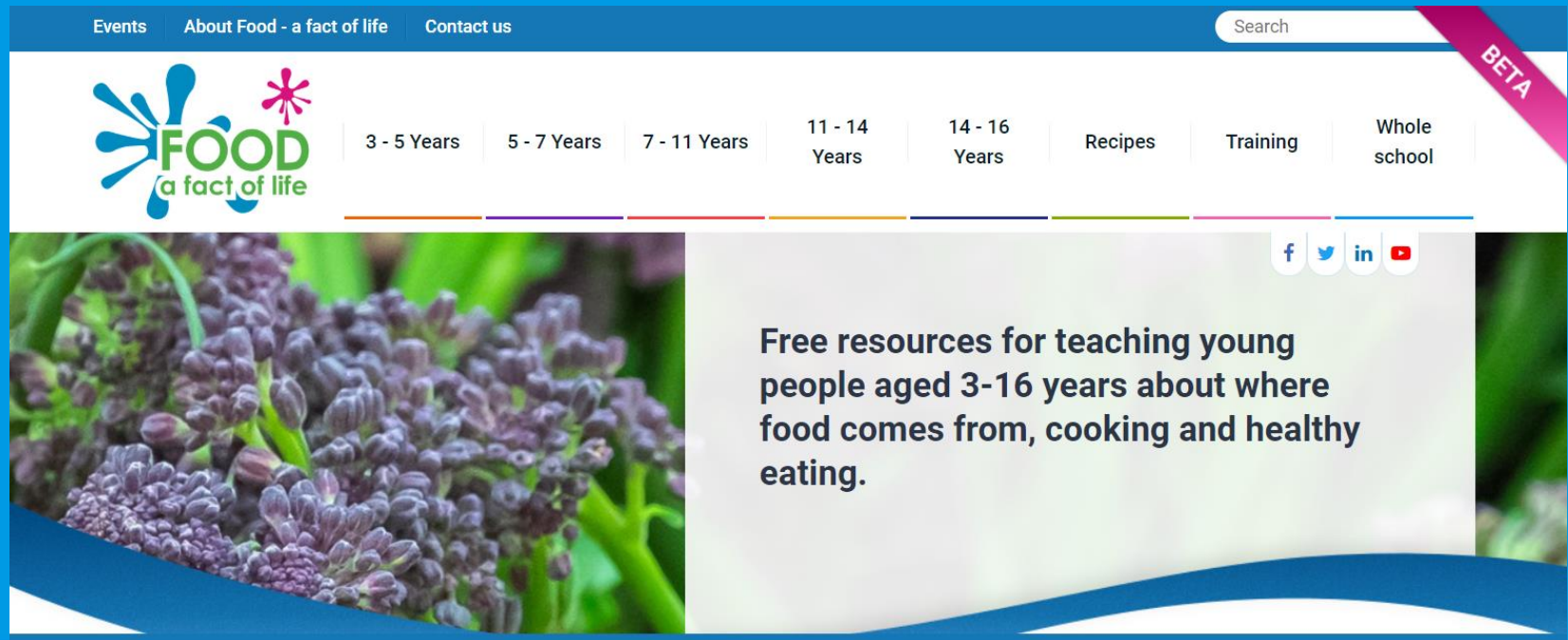# Exploring Excel

using resources to teach sensory evaluation

from the Food A Fact of Life website

Overview

Sensory evaluation using Excel (Food A Fact of Life)

- Paired comparison (discrimination) tests
- Paired comparison (preference) tests
- Hedonic scales
- Triangle tests
- Star diagrams

  http://fuse.education.vic.gov.au/?8WNJPC

- **Links to curriculum and ideas for teaching and learning strategies**
- **Questions**

Sensory evaluation

a scientific discipline that measures and analyses human responses to the characteristics of foods

For example, appearance, taste, touch, smell, texture and temperature.

Potato chips and Pringles images

https://www.businessinsider.com.au/we-tried-lays-new-potato-chip-flavors-2016-1

Characteristic

An attribute of a material (food) that is usually detected using human senses, such as its taste, texture or colour; for example,
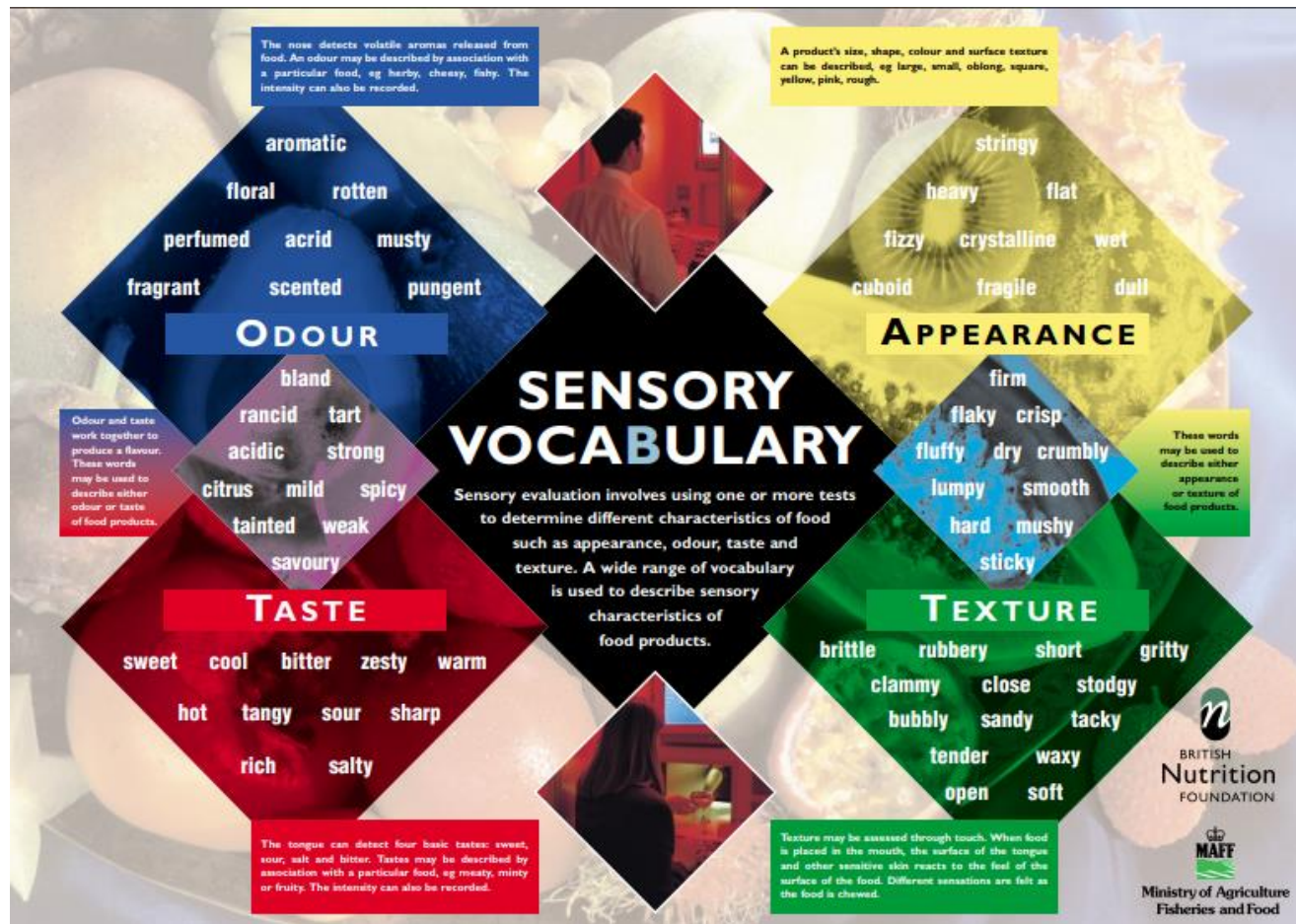
- bitterness
- mealiness
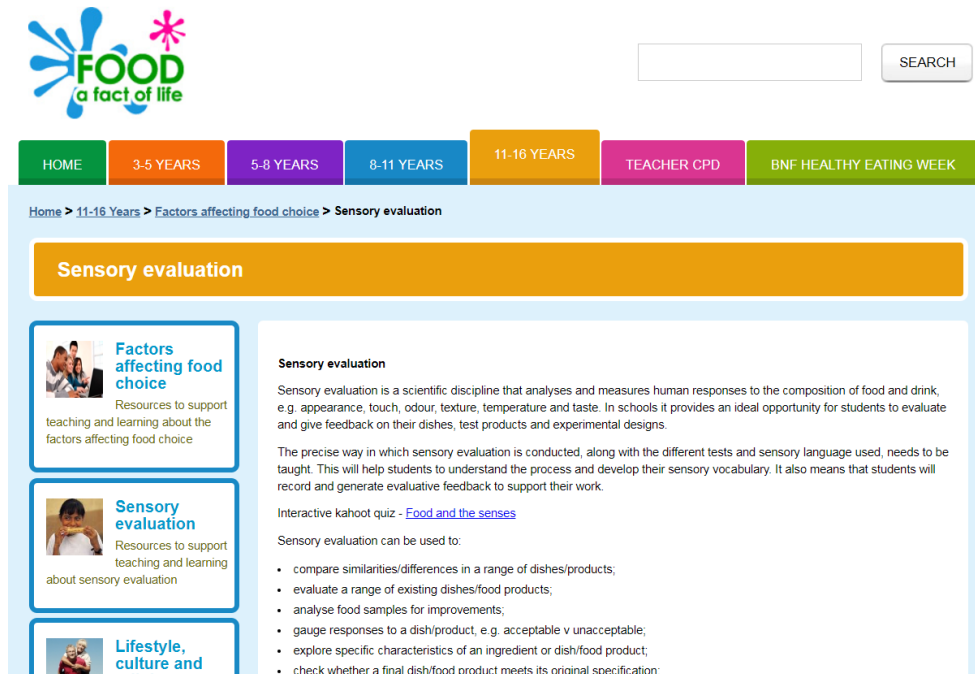- redness.

Property

A quality or behaviour of a material (food) that can be tested and can be used to help people select suitable materials (food) for particular uses; for example,

- solubility
- stability (water activity)
- structure.

Food A Fact of Life website

Food A Fact of Life website (UK)

http://archive.foodafactoflife.org.uk/Sheet.aspx?siteId=19&sectionId=135&contentId=818

Range of sensory evaluation tools
- Focus on Excel spreadsheets

- Duo Trio.xls (287.5 kB)
- Excel chart 5 point 1 product.xls (294.5 kB)
- Excel chart 5 point 2 products.xls (294.5 kB)
- Excel chart 5 point 3 products.xls (296 kB)
- Excel chart 5 point 4 products.xls (295.5 kB)
- Excel chart 10 points 1 product.xls (294.5 kB)
- Excel chart 10 points 2 products.xls (294.5 kB)
- Excel chart 10 points 3 products.xls (296 kB)
- Excel chart 10 points 4 products.xls (295.5 kB)
- Hedonic scale for 3 products.xls (291.5 kB)
- Hedonic scale for 4 products.xls (291 kB)
- Hedonic scale for 5 products.xls (291.5 kB)
- Paired comparison descrimination sheet.xls (287 kB)
- Paired comparison preference sheet.xls (287 kB)
- Triangle test sheet.xls (288 kB)

Link to various stages of the design process
- investigating
- generating
- producing
- evaluating
- collaborating and managing

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Use sensory evaluations to

Sensory evaluation can be used to:

- compare similarities and/or differences in foods or designed solutions

- evaluate a range of existing food products or analyse food products for improvements;

- gauge responses to design options and/or designed solutions

- explore specific characteristics of a food

- check whether a designed solution meets its original specifications

- provide objective and subjective feedback data to enable informed decisions to be made

- monitor design processes by checking samples against specifications

Design and Technologies

7-8: **Investigate the ways in which products, services and environments evolve locally, regionally and globally and how competing factors including social, ethical and sustainability considerations are prioritised in the development of technologies and designed solutions for preferred futures** (ACTDEK029)

9-10: **Critically analyse factors, including social, ethical and sustainability considerations, that impact on designed solutions for global preferred futures and the complex design and production processes involved** (ACTDEK040)

(ACARA)

7-8: **Analyse how characteristics and properties of food determine preparation techniques and presentation when designing solutions for healthy eating** (ACTDEK033)

9-10: **Investigate and make judgments on how the principles of food safety, preservation, preparation, presentation and sensory perceptions influence the creation of food solutions for healthy eating** (ACTDEK045)

(ACARA)

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Sensory evaluation

Paired comparison (discrimination)

Comparing **two types of food**

and

determining the **difference in an attribute**

of the two foods

Paired comparison (discrimination)

Comparing two types of apples and determining the crunchiness of the two apples

Other **characteristics**
sweetness, colour, acidity, juiciness

- Granny Smith
- Red Delicious
- Cripps Pink (sold as Pink Lady)
- Fuji
- Gala
- Golden Delicious
- Jonagold
- Braeburn
- Cripps Red (sold as Sundowner)
- Jazz,
- Bravo
- Kalei
- Eve
- Modi
- Envy
- Kanzi
- Greenstar
- Smitten

Paired comparison (discrimination)

Paired Comparison (Discrimination)

Instructions

Prepare two samples of **apples: Eve and Jazz**

Ask the panelists to compare one attribute between the two samples, e.g. crunchier.

Attribute tested =   **crunchiness**

Results

Record each taste panelist's choice with either a '1' or '0' in the appropriate box (1=can detect the attribute, 0=not)

Sample	Panelist									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Apple A	1	0	0	1	1	1	1	0	1	1
Apple B	0	1	1	0	0	0	0	1	0	0

Sample	Total	%		
Apple A	7	70.0	thought this sample to be	crunchiness
Apple B	3	30.0	thought this sample to be	crunchiness

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https://www.mccormick.com/flavor-forecast-2019

https://soundcloud.com/gastropodcast/seeds-of-immortality#t=0:00

WHY THE NEED FOR SEED?

Seeds connect to key macro trends in food today:

Real Food – Seeds are chosen as they offer "simple" and "real" nutrients and are free of artificiality

Health & Wellness – Seeds contain a balance of nutrients - good fats and plant proteins that fit with many dietary approaches

Culinary – Consumers seek upgraded and global flavours in their everyday food experiences

INTRODUCING...

BASIL SEED:
THE NEW CHIA

Basil seeds give texture and wholesome goodness to both sweet and savoury dishes. They can add a unique pop to juice drinks, shakes and smoothies. Try them in sweet desserts, salad dressings, yoghurt, dips and pasta dishes. Highly nutritious, the seeds contain Vitamin K, protein, phytochemicals and polyphenol.
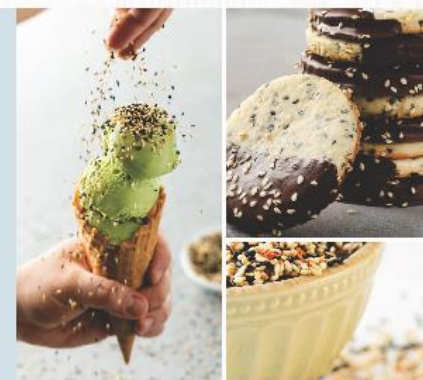
LOTUS SEED:
CROSSING BORDERS

Lotus seeds, also known as a fox or gorgon nut, are a favourite in Asian cuisine and should be embraced around the world. Add dried lotus seeds in place of beans in soups and stews for a new taste. When puffed, these crunchy, floral popcorn-like bites can shake up your snack routine.

SESAME SEED:
VERSATILE WONDER

Most are familiar with white sesame seeds, but it's time to put black sesame seeds on the map too. Toasted together, the two add texture, colour and a warm, nutty taste, though they're entirely nut-free! Double up to add colour and use as a condiment to sprinkle on veggies, mains and desserts!

ANCIENT SEEDS

These seeds date back to ancient Roman, Greek and Egyptian civilisations and are now being rediscovered in new ways. The key seeds to watch out for are mustard, coriander, cumin and caraway. The best ways to eat these seeds is whole, cracked, toasted, pickled, infused in oil or within seasoning blends.

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Tip

samples of food coded randomly to avoid the students having a preference

e.g. sample 1, sample 2, sample 3 etc

Paired comparison (discrimination)

Comparing two types of **bread** and determining the **saltiness** of the two bread

Example

Healthy Food Guide magazine

Paired comparison (preference)

Paired Comparison (Preference)

Instructions
Prepare two samples.
Ask the panelists which sample they prefer.

Results
Record each taste panelist's choice with either a '1' or '0' in the appropriate box (1=preferred, 0=not).

Sample	Panelist									
	1	2	3	4	5	6	7	8	9	10
Apple A	1	0	1	1	0	1	1	1	1	1
Apple B	0	1	0	0	1	0	0	0	0	0

Sample	Total	%	
Apple A	8	80.0	thought this sample to be better.
Apple B	2	20.0	thought this sample to be better.

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Pink Lady apples

Organic pre-packaged

Loose

Kids packs

Pre-packaged

Home grown

Attributes: Cost, packaging, food miles, taste, appearance, etc

Hedonic scales

- **students indicate the extent of their like or dislike for a food on a continuum**

Hedonic scale for three products

Hedonic Scale

How many people are tasting your food? 10

Sample	Dislike Very Much	Dislike	Neither Like or Dislike	Like	Like Very Much
Farro	1	3	4	2	0
Teff	0	5	3	2	0
Barley	0	1	4	4	1

Scores

Farro	27	out of a possible	50
Teff	27	out of a possible	50
Barley	35	out of a possible	50

Maximim score =	50	(This is the highest score possible for this test.)
Minimum score =	10	(This is the lowest score possible for this test.)

Percentages

Farro	30.34	%
Teff	30.34	%
Barley	39.33	%

Instructions

1. Enter the total number of people who will be tasting your samples.

2. Type in the sample names - you can have up to 3 samples using this template.

3. For each sample, record each person's resonse. For example, if they select 'Like' type in 1. If the next person also selects 'Like' for the same sample, them increase the score to 2.

4. The scores will automatically appear.

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Triangle tests

different varieties and brands of eggs: free range, barn laid, organic, cage free

Triangle test

Triangle Test

Instructions
Prepare three samples, two of which are the same.
Ask the panelists to decide which one is the 'odd one out'.

Results
Record each taste panelist's choice with either a '1' or '0' in the appropriate box (1=odd one out, 0=no)

Sample	Panelist									
	1	2	3	4	5	6	7	8	9	10
Egg A	1	0	0	1	0	1	1	0	0	0
Egg B	0	1	1	0	0	0	0	0	0	0
Egg C	0	0	0	0	0	0	0	1	0	0

Sample	Total	%	
Egg A	4	57.1	thought this sample was the odd one out.
Egg B	2	28.6	thought this sample was the odd one out.
Egg C	1	14.3	thought this sample was the odd one out.

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Star diagram for two similar products

Star Chart/Diagram for Comparing Two Similar Products

Attributes	Product 2	Product 2
colour of yolk	5	3
taste	4	3
mouthfeel	5	5
tenderness of white	3	3
size of yolk compared to amount of white	4	5
colour of white	3	1
shape of yolk	3	2
texture of yolk	3	4

Instructions
1. Choose 8 sensory attributes that describe the characteristics of the product, e.g. crunchy, spicy or smooth.

2. Taste the two samples. Decide on the intensity of each attribute for each sample, using a scale from 0 to 5 (the higher the number the greater the intensity).

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Questions?

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