

Food, Fibre and the Future

Report on surveys of students' and teachers' knowledge and understanding of Primary Industries

To
Primary Industries Education Foundation

by



Australian Council *for* Educational Research

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Introduction

Primary Industry plays a vital role in Australian's economy and society, but the gap between rural and urban communities is growing, contributing to a lack of understanding of where food and other basic necessities of life come from. The recent television advertisement in which the grandfather shows a row of plants to his granddaughter and says "this is where peas come from" – to which she retorts "don't be silly Grandad, peas come from the freezer" is an excellent example of this disconnect between the community and the industries that sustain them. While intended as a humorous element, there is a concern that this may be an accurate representation of the understanding and experiences of many young Australians.

Background to the project

The goal of the Primary Industries Education Foundation (PIEF) is to provide a source of information on primary industries for educators, to better equip students with not only knowledge about what goes into their food and fibres but also what career opportunities exist in primary industries. In 2010, PIEF contracted the Australian Council for Educational Research (ACER) to design and conduct a baseline survey of students and teachers to find out what they know about primary industries in Australia.

This project required that the ACER team work with representatives from the PIEF, with staff from Agriculture Education in each state and with other stakeholders such as the National Farmers' Federation and other peak bodies to develop a research-based instrument to assess students' knowledge and understanding of issues facing the primary industries, focusing on where food and fibre products come from.

Development of the surveys

In the first stage of the project, the ACER project team consulted with PIEF and its various members/stakeholders to review the research in the area and to define the scope of the project.

A review of the literature revealed very limited research conducted in this area in Australia. While various members of PIEF had conducted reviews and evaluations of programs they were conducting in schools, any survey questions developed for these projects focused on students' and teachers' experiences of those particular programs rather than on their broader understanding or knowledge of primary industries issues. Internationally, a series of studies conducted by an American researcher, Professor Martin Frick, were identified as relevant. Frick's research¹ investigated students' agricultural literacy and survey items used in his studies were seen as a potential source of questions for the current project. In particular, the survey designed by Frick and colleagues contains a number of items designed to measure

¹ For instance, see Frick, M.J. Kahler, A.A. & Miller, W.W. (1991). *A definition and concepts of agricultural literacy*. *Journal of Agricultural Education*, 32 (2), 49-57.

young peoples' attitudes towards agriculture and farming as well as their knowledge of various issues regarding the sustainability of agricultural practices.

Student survey

An experienced item writer, who has worked on developing test items for international assessments of scientific literacy, was added to the ACER team to develop questions that would be suitable for assessing the understanding of Grade 6 and Grade 10 students of where food and fibre products come from. Other items, focusing on Grade 10 students' interest in pursuing further study and employment in areas related to primary industries and teachers' experiences of learning and teaching in areas related to primary industries, were developed by team members with experience in survey design.

After consultation with members of the PIEF representing Fisheries, Forestries and the Wool industry, additional test items investigating these areas were added. The resulting draft surveys were provided to PIEF for review. Feedback provided by PIEF was used to refine the list of test items and survey questions, which were then entered into the online platform for cognitive interviews and pilot testing.

Cognitive interviews were conducted with a number of Grade 6 and Grade 10 students to ensure that the vocabulary and response categories were accessible, understandable and appropriate. Cognitive interviews are a technique for testing and improving survey questions, with the aim of reducing misinterpretation of questions and resulting poor data. The "verbal probing" method was used, in which the participant is read aloud the target question, response options and answers, and is then asked other specific questions about the question and response categories themselves (e.g., "What did you understand that word to mean?" "Is there a simpler way to ask that?"). As a result of the cognitive interviews, a number of test items were eliminated as the concepts or vocabulary involved were not readily understood by the younger students.

A trial of the online survey process (including providing instructions to students, logging on to the survey, following the online instructions and collection of data) was then conducted with two classes of Grade 6 students in a Victorian primary school.

The trial was conducted to ensure that the questions and instructions were clearly understood. This was also an opportunity to test the online administration process. Feedback from students indicated that, except for a few problematic words and phrases (which were subsequently modified), the language used in the survey was clear and easily understood. There were no issues identified with the online provision of the survey, allowing for the presentation of visual stimuli such as photos and privacy of responses. In fact, students reported that this mode of provision was more engaging than a traditional pencil and paper format.

Teacher survey

The survey of teachers focused on how primary industries are treated in the curriculum, related educational programs that the schools are involved in, and teacher knowledge of primary industries. During the trial of the student surveys, teachers of the participating Grade 6 classes provided feedback on the content and format of the survey for teachers. No issues with the content of the survey or difficulties with understanding the instructions were identified.

Copies of the surveys for Grade 6 students, Grade 10 students and teachers are included in the Appendices.

Permissions

State and Territory governments were contacted to request permission to conduct research in their schools. This process involved completion of applications that provided details about the aims of the research, processes involved in obtaining informed consent from principals, parents/guardians, students and teachers, any foreseeable impact of participation on those involved, and agreement that a short report be provided to the relevant bodies upon completion of the research.

The sample

A sample of 150 primary schools and a sample of 150 secondary (or central) schools were selected with probability proportional to size of the student populations (Grade 6 and Grade 10). Rather than selecting a single class to participate, the decision was made to invite all students in the target grade levels to participate. This approach was designed to achieve higher response rates than would be possible with other approaches to surveying this population, such as selecting a single class to participate. The sample of schools was selected with the intention of minimising overlap with the National Assessment Program, as it was anticipated that involvement in these other studies would reduce the likelihood of schools participating in the PIEF survey.

Given the interruption to schooling in a number of states due to extreme weather events, 600 possible replacement schools were also identified for contact, should a significant proportion of the original sample be unable to participate due to unavailability of computer resources, temporary accommodation due to weather damage, etc.

The ACER sampling frame was used for sample selection. ACER maintains an up-to-date dataset of all Australian schools by state and territory and sector, with enrolment numbers by year level, as well as location and contact details. The ACER Sampling Frame is developed annually by ACER by coordinating information from multiple sources, including the Australian Bureau of Statistics (ABS) and Commonwealth, State and Territory education department databases.

The sampling frame enabled stratification of the population by State to ensure that the sample was representative of students across these variables. Geographic location was also considered in the sampling of schools, with the proportion of non-metropolitan based schools increased above their actual representation in the population.

The number of schools in each state selected as part of the original sample of 300 schools is presented in the table below.

State	Number of Primary schools sampled	Number of Secondary schools sampled	Total
ACT	2	1	3
New South Wales	38	38	76
Victoria	37	31	68
Queensland	37	37	74
South Australia	11	2	13
Western Australia	18	9	27
Tasmania	5	2	7
Northern Territory	2	2	4

In reality, it proved to be very difficult to achieve the cooperation of schools to participate in the survey. The amount of survey activity occurring in schools has grown substantially in recent years and schools are increasingly reluctant to participate in additional surveys. With respect to this particular survey, it became apparent that the decision at the federal level not to include Agriculture in the National Curriculum was being communicated down to schools. This resulted in a reluctance to participate in a survey where there was no clear and direct connection to an area of the curriculum as primary industries was not generally seen as 'core business' by many schools.

Because of the low response rates from the initial sample of schools, it was decided, in consultation with PIEF, to extend the invitation to participate to the additional 600 replacement schools that had been identified in the sample selection.

The total number of schools that agreed to participate in the survey by state/territory and level is presented in the table below.

State	Number of Primary schools participating	Number of Secondary schools participating	Total number of schools participating
ACT	0	0	0
New South Wales	2	10	12
Victoria	7	7	14
Queensland	11	12	13
South Australia	7	1	8
Western Australia	6	4	10
Tasmania	2	2	4
Northern Territory	0	0	0
Total	35	36	71

The total number of responses from Grade 6 students, Grade 10 students and teachers are presented in the table below.

Respondent group	Number of valid responses received
Grade 6 students	213
Grade 10 students	687
<i>Primary teachers</i>	22
<i>Secondary teachers</i>	31
Total teachers	53

Data collection

Participating schools were sent information packs about the Food, Fibre and Your Future surveys, including information about the project for principals, parents, students and teachers, consent forms for parents/guardian, students and teachers, and reply paid envelopes for the returns of all consent forms. Once the surveys were available online for completion, participating schools were then sent an email with the addresses (urls) for each of the surveys.

The data collection period was originally set to run from June/July 2011 to the end of Term 3 in Victoria (September 23rd) but was extended a further fortnight after some schools requested additional time to participate following scheduling difficulties.

The online surveys were closed at 5pm EST October 6th 2011.

Results

In this section, the results of the surveys are presented as percentages, indicating the frequency of a particular response to a survey item. In cases in which similar items were used in the Grade 6 and the Grade 10 surveys, the results are presented together to allow for comparison between the two student groups' responses. In the case of multiple-choice style items, the single correct answer is represented by a shaded column or row.

For the teacher surveys, the responses are presented separately for primary and secondary teachers.

Student surveys

A number of items were presented to Grade 6 and Grade 10 students, with slight language variations, in order to monitor any differences in the understanding and knowledge of students at different stages in their education. Responses to these items are presented first, followed by a section for those items presented only to Grade 6 students and then items presented only to Grade 10 students.

True or False items

	Grade 6 students				Grade 10 students			
	True		False		True		False	
	n	%	n	%	n	%	n	%
Some raw materials for fabrics, fuels and buildings come from farms (T)	109	54	94	46	458	70	197	30
Plants are the main source of human foods (T)	137	67	67	33	370	57	281	43
There are laws to control how many fish are caught in Australia (T)	174	86	29	14	572	88	80	12
The number of jobs in Agriculture is growing (T)	120	59	85	41	365	56	289	44
90% of the sheep in Australia are the same breed (T)	106	52	97	48	322	49	332	51
Farming methods change due to increases in scientific knowledge and developments in technology (T)	164	81	39	19	556	85	98	15
Australia exports more food products than it imports (T)	98	50	99	50	371	60	247	40
Most of the logs harvested in Australia come from native tree forests (F)	145	71	59	29	392	60	262	40
Australia produces the same amount of wheat every year (F)	52	26	145	74	101	16	517	84

- Similar proportions of Grade 6 and Grade 10 students correctly identified that there are laws to control the size of fish catches, that 90% of sheep in Australia are the same breed, that farming methods change due to science and technology developments, and that the number of jobs in Agriculture is growing.
- A higher proportion of Grade 10 students than Grade 6 students correctly identified that raw materials for fabrics, fuels and buildings come from farms, that Australia exports more food than it imports and that Australia does NOT produce the same amounts of wheat every year.
- The majority of Grade 6 and Grade 10 students were incorrect in their response to the item about where most of the logs harvested in Australia come from, with 70% of Grade 6 students and 60% of Grade 10 students indicating that most of the logs come from native tree forests, when in fact, two-thirds of the harvest are from plantations, with the rest coming from native forests.

Students were also asked to indicate whether they were sure or unsure about their responses. The following table takes those students who were correct in their responses to the items and presents the proportions who were sure and not sure about their responses.

	Grade 6 total				Grade 10 total			
	Sure		Not sure		Sure		Not sure	
	n	%	n	%	n	%	n	%
Some raw materials for fabrics, fuels and buildings come from farms (T)	75	69	34	31	272	59	186	41
Plants are the main source of human foods (T)	113	83	24	17	262	71	108	29
There are laws to control how many fish are caught in Australia (T)	153	88	21	12	471	82	101	18
The number of jobs in Agriculture is growing (T)	71	59	49	41	191	52	174	48
90% of the sheep in Australia are the same breed (T)	44	42	62	58	110	34	212	66
Farming methods change due to increases in scientific knowledge and developments in technology (T)	127	78	37	23	407	73	149	27
Australia exports more food products than it imports (T)	48	49	50	51	206	56	165	44
Most of the logs harvested in Australia come from native tree forests (F)	24	41	35	59	100	38	162	62
Australia produces the same amount of wheat every year (F)	94	65	51	35	289	56	228	44

- The majority of students were correct and sure of their responses regarding laws controlling fishing, and farming methods changing in response to technological developments.

- There was less certainty about whether the number of jobs in Agriculture is growing, whether Australia produces the same amount of wheat each year and whether food exports from Australia are greater than food imports to Australia.
- Students were very unsure of their response to whether 90% of sheep in Australia are the same breed, with around two-thirds of both Grade 6 and Grade 10 students who were correct in their response (true) indicating that they were unsure of their answer.
- Students were also unsure of their response to the item about logging and native forests. Less than half of the students were correct in their response to this item, and of those who were correct (indicating that the statement was false), more than half were unsure of their response.

Students also responded to a set of True/False items that were designed to measure attitudes, rather than knowledge.

Attitudinal items	Grade 6 students				Grade 10 students			
	True		False		True		False	
	n	%	n	%	n	%	n	%
Wildlife cannot survive in an area where there is farming	65	33	132	67	231	37	388	63
There will always be plenty of seafood in the ocean	76	39	121	61	127	20	492	80
Farming damages the environment	34	17	163	83	247	40	371	60

- One third of students believe that wildlife are unable to survive in farming areas.
- One in three Grade 6 students believes that there will always be plenty of seafood in the oceans, compared to one in five Grade 10 students, suggesting an increasing awareness of seafood sustainability issues with age.
- More than twice as many Grade 10 students, compared to Grade 6 students, believe that farming damages the environment (40% and 17% respectively).

Grade 6 students were presented with some True or False items and some attitudinal items in addition to those reported above.

	Grade 6 students			
	True		False	
	n	%	n	%
Trees produce wood that can be used in building materials for houses and furniture (T)	187	95	10	5
Shearing the wool from a sheep is like cutting hair (T)	133	68	64	32
Farming is necessary to grow enough food (T)	177	90	20	10
Milk that is straight from the cow has no bacteria in it (F)	72	36	131	64
Farmers look after the soil to keep it healthy (attitudinal)	179	88	24	12
Farmers look after their animals well (attitudinal)	187	95	10	5

- Most of the Grade 6 students correctly identified that trees produce wood that is then used to make houses and furniture and that farming is necessary in order to produce enough food.
- Around two-thirds of the students correctly identified that shearing wool from a sheep is similar to cutting hair and that milk that comes straight from the cow does have some bacteria in it (i.e that the statement was false).
- The majority of students had positive views of farmers and believed that farmers take care of the soil (to keep it healthy) and of their animals.

	Grade 6 students			
	Sure		Not sure	
	n	%	n	%
Trees produce wood that can be used in building materials for houses and furniture (T)	157	84	30	16
Shearing the wool from a sheep is like cutting hair (T)	113	85	20	15
Farming is necessary to grow enough food (T)	142	80	35	20
Milk that is straight from the cow has no bacteria in it (F)	76	58	55	42

- Students were very confident of their response to the items about trees and wooden building materials and farming being necessary to produce enough food.
- While a smaller proportion of students correctly responded that shearing wool from a sheep is similar to cutting hair compared to the items about tree and farming, the majority of those who were correct were confident in their response (85%).
- Students were much less confident in their response to the item about bacteria in raw milk.

Grade 10 students were presented with some True or False items in addition to those reported above.

	Grade 10 students			
	True		False	
	n	%	n	%
Forests can be managed to produce wood at the same time as protecting the environment (T)	439	67	213	33
Using pesticides to kill insects has increased the amount of food grown on farms (T)	334	54	285	46
Sustainable farming keeps the soil fertile (T)	539	87	80	13
Homogenised milk has no bacteria in it (F)	255	39	395	61

- The vast majority of students correctly identified that sustainable farming maintains soil fertility.
- Two-thirds of the Grade 10 students correctly identified that forests can be managed to produce wood while protecting the environment.

- Around half of the students identified that pesticide use has increased production on farms.
- Less than two-thirds of the students correctly identified that the statement about homogenised milk not containing bacteria was false (this item was difficult but intended to discern whether students knew the difference between the processes of homogenisation and pasteurisation in milk processing).

	Grade 10 students			
	Sure		Not sure	
	n	%	n	%
Forests can be managed to produce wood at the same time as protecting the environment (T)	268	61	171	39
Using pesticides to kill insects has increased the amount of food grown on farms (T)	208	62	126	38
Sustainable farming keeps the soil fertile (T)	358	66	181	34
Homogenised milk has no bacteria in it (F)	95	37	160	63

Interestingly, although the proportions of students who were correct in their responses to these four items differed greatly across the items, levels of confidence for those who were correct were very similar across the items:

- While 87% of students were correct in their response to the item about sustainable farming, only two-thirds of those who were correct were sure of their answer.
- Only half of the students were correct in their response to the item about pesticide use increasing food production, but again, just under two-thirds of those who were correct were sure of their response.
- Of those students who responded correctly to the homogenized milk item, almost two-thirds were not sure of their answer.

Dairy breed item

Which breed is a type of cow grown in Australia to produce milk?

Response	Grade 6		Grade 10	
	n	%	n	%
Angora	28	14	96	18
Friesian	64	33	174	32
Hereford	65	33	211	39
Landrace	38	20	66	12

- About one third of students in both Grade 6 and Grade 10 were able to recognise Friesian as dairy cattle.
- One third of Grade 6 students incorrectly identified Hereford cattle as a dairy breed, while a slightly higher proportion of Grade 10 students (39%) made this same error.

Natural fibres item

Where do natural fibres come from?

Response	Grade 6		Grade 10	
	n	%	n	%
just plants	44	23	158	28
just animals	20	11	24	4
both plants and animals	117	61	363	64
just plants eaten by animals	10	5	19	3

- Over 60% of both Grade 6 (61%) and Grade 10 (64%) students could recognise that natural fibres could be made from both plant and animal materials.
- Around one quarter of students (23% of Grade 6 and 28% of Grade 10) believed that natural fibres could only come from plants.

Plant or animal product item

Tell us if you think each of items on this list is a plant product or an animal product...

	Plant product				Animal Product			
	Grade 6		Grade 10		Grade 6		Grade 10	
	n	%	n	%	n	%	n	%
Pasta	152	80	563	93	38	18	43	7
Cotton socks	48	25	351	58	142	75	255	42
Potato chips	181	95	580	96	9	4	26	4
Coffee	185	97	588	97	5	2	18	3
Scrambled eggs	31	16	35	6	159	84	571	94
Woollen rug	9	4	61	10	181	95	545	90
Yoghurt	51	27	81	13	139	73	525	87
Pearl necklace	58	31	76	13	132	69	530	87

- The majority of Grade 6 and Grade 10 students correctly identified pasta, potato chips and coffee as being plant products.
- The majority of Grade 6 and Grade 10 students correctly identified scrambled eggs, a woollen rug, yoghurt and a pearl necklace as being examples of animal products.
- Both Grade 6 and Grade 10 students appeared to have difficulty in identifying cotton socks as being a plant product, with only one quarter of Grade 6 students and close to 60% of Grade 10 students getting this item correct.
- Greater proportions of Grade 10 students, compared to the younger students, responded correctly to the pasta, cotton socks, scrambled eggs, yoghurt and pearl necklace items.

Product origins item

Think about where each of these every-day items started out from – did it grow (on a plant or animal on a farm) or was it made in a factory or laboratory?

	Grew				Made			
	Grade 6		Grade 10		Grade 6		Grade 10	
	n	%	n	%	n	%	n	%
Wool	187	99	570	96	2	1	26	4
Cotton wool	174	92	520	87	15	8	76	13
Sugar	149	79	534	90	40	21	62	10
Cooking oil	119	63	425	71	70	37	171	29
Cardboard	29	15	179	30	160	85	417	70
Plastic	3	2	22	4	186	98	574	96
Glass	19	10	29	5	170	90	567	95
Lycra	62	33	179	30	127	67	417	70
Aluminium foil	-	-	26	4	-	-	570	96

- More than three quarters of Grade 6 and Grade 10 students correctly identified wool, cotton wool and sugar as items that grow and plastic and glass as items that are made.
- Slightly lower proportions of students correctly identified that cooking oil comes from something that grows and that lycra is something that is made in a factory or laboratory.
- The vast majority of Grade 10 students correctly identified aluminium foil as something that was made (Grade 6 students were not presented with this item).
- Interestingly, the majority of students, both Grade 6 and Grade 10, incorrectly identified cardboard as something that was made in a factory or laboratory, rather than recognising that it starts out as a plant and is thus grown. The misunderstanding may indicate that students had not considered the origin of the item (as instructed) but had instead focused on the processing involved. However, they were able to correctly identify the origin of cooking oil (an item that is also quite removed from its original form by processing).

Family in Primary Industries

Does anyone in your family work in these sorts of jobs? Grade 6

	n	%
Farming to grow food or fibre (agriculture)	43	20
Timber production (forestries)	11	5
Fishers and seafood farming (aquaculture)	7	3
None of these	132	62

Note: students could select more than one industry

Does anyone in your extended family work in these Primary Industries? Grade 10

	n	%
Agriculture/farming	167	24
Fisheries	49	7
Forestry	35	5

Note: students could select more than one industry

- Between one in five and one in four students had a family member working in Agriculture.
- The majority of Grade 6 respondents did not have any family members working in Primary Industries.

Grade 6 only items

Lunchbox (food) item

Soula has a cheese sandwich and a banana in her lunchbox. Which foods in her lunchbox come from farms?

Response	n	%
Just the banana	27	14
Just the banana and the cheese	47	24
Just the bread and the banana	15	8
All of them	107	55

- Over half (55%) of the Grade 6 respondents correctly identified that all of the foods (bread, cheese and banana) come from farms.
- The next most common response, "Just the banana and the cheese" may indicate that the students had not associated the bread in the sandwich with a farming product (wheat).

Grass and wool (fibre) item

Why is grass important for growing wool?

Response	n	%
Grass keeps the sheep cool	6	3
Sheep like to walk on grass	3	2
Grass keeps down dust that can make wool dirty	15	8
Grass is the main food of sheep	170	88

- The majority of Grade 6 students correctly identified that grass is important for growing wool because it is the main food of sheep.
- Fewer than 10% of students indicated that grass was important because it kept dust from dirtying wool.

Cheese (food) item

Cheese can be made from...

Response	n	%
Milk from cows	70	37
Milk from sheep	0	-
Milk from goats	16	9
All of the above	100	53
None of the above	2	1

- Just over half of the Grade 6 respondents correctly identified that cheese can be made from cow, sheep or goats milk (All of the above).
- Over one third of the Grade 6 students thought that cheese could only be made from cows' milk, while less than 10% thought it was made only from goats' milk.
- These responses may reflect a lack of familiarity with different types of cheese, rather than a misunderstanding of the processes involved in its production, but still indicate a gap in the knowledge and experiences of these students.

Jobs related to farming item

Grade 6 students were asked to write the name of one other job that is related to farming:

- The most common response was 'shearer' or some variation.
- Other common responses included 'harvester/harvesting', 'farm hand', 'cane grower/cutter/harvester', 'fruit picker'.
- Rarer responses indicated deeper knowledge of farming practices and included 'vet', 'spray contractor', 'stockman', 'jillaroo', 'electrician (to fix tractors and work with broken parts)', and 'cattle sorter'.
- Some of the more creative responses included 'dog', 'convicts' and 'caterer'.

School activities item

Have you and your class done any of these things at your school this year?

Activity	n	%
School vegetable gardens	112	53
Farm stays or visits	35	16
Attend Royal or local Agricultural Show Days	25	12
Picasso Cows	19	9
Compete at Royal or local Agricultural Show Days	16	8
Visit Marine Discovery Centres (or similar)	11	5
Weed Warriors environmental programs	6	3
None of these	38	18

Note: students could select more than one activity

- The most commonly reported Primary Industries-related school activity was growing a school vegetable garden, with just over half of the Grade 6 students participating in this activity.
- Close to one in five Grade 6 students indicated that they had not participated in any school activities related to Primary Industries.
- Other activities reported by the Grade 6 students included maintaining compost heaps and worm farms (presumably linked to the school gardens), coastal revegetation projects, tree-planting days and bread-making in a science class (this activity was possibly related to yeast and the fermentation process rather than the life cycle of wheat, it was not possible to tell from the response).

Grade 10 only items

Fruit orchard (food) item

Grade 10 students were asked to complete the following item:

The fruit bowl has apples, pears, grapes and mangoes in it. How did the fruit travel from the fruit orchard to the bowl on the table? Put the stages in the correct order – orchard, fruit bowl, refrigerated truck, packing shed, fruit shop.

Students were marked as correct if they could identify that the packing shed was the second stage and that the fruit bowl was the final stage.

- Just over three-quarters of students (76% or 523 students) were able to identify these stages in the correct order.

Tree plantation (fibre) item

The most important role for tree plantations is to...?

Response	n	%
provide homes for wildlife	157	28
preserve the land beneath the trees	144	26
give shelter to cattle and sheep	25	5
produce good quality timber	229	41

- Just over 40% of students identified the production of good quality timber as the role of tree plantations.
- The popularity of two of the other responses ‘provide homes for wildlife’ and ‘preserve the land’ may suggest that students have misunderstood tree plantations as being more like park reserves rather than tree ‘farms’.

Seafood species (food) item

Grade 10 students were presented with several seafood species and asked to select which of these were farmed in Australia. All of these seafood species are currently farmed in Australia.

- 82% of students identified that barramundi were farmed.
- 27% of students identified that salmon were farmed.
- 84% of students identified that prawns were farmed.
- 80% of students identified that oysters were farmed.
- 26% of students identified that eels were farmed.

While the majority of Grade 10 students were able to identify barramundi, prawns and oysters as species that are farmed in Australia, only around one in four students were aware that salmon and eels are also farmed.

Wool products (fibre) item

After listing men's suits as an example of a product made of Australian wool, Grade 10 students were asked to name two other wool products. The most commonly reported products were jumpers, socks and blankets, followed by scarves and rugs (it should be noted that students had already been presented with an item that made reference to a woollen rug).

Wheat products (food) item

Students were also given bread as an example of a product made of wheat and asked to list two other wheat products. Cereal, in particular weet-bix, was the most commonly reported item, followed by pasta and flour.

Further study and careers items

Grade 10 students were also presented with a list of careers in the primary industries area. They were asked if they had heard of the job and also whether they knew anything about it.

Career	Percentage that had heard of the job	Percentage that knew about the job
Veterinarian	91	84
Fish farming	87	69
Apiarist/beekeeper	79	68
Plant breeder	71	59
Orchardist	73	58
Land management	80	57
Irrigation engineer	61	41
Horticulturalist	55	39
Wool classer	45	35
Animal husbandry	41	32

- Students were most familiar with the role of a veterinarian and least familiar with animal husbandry.
- For all of the listed jobs, greater proportions of students had heard of the job than felt that they knew something about what the job entailed.

Students were asked to look at a list of processes and mark which of these they associated with farming or agriculture.

Process	Percentage of students that associated process with farming
Harvesting	97
Quality control	81
Processing	79
Distribution	75
Sales	70
Scientific research	57
Genetic modification	64
Hygiene	62
Transport	53
Innovation	45

- Harvesting and quality control were the two processes most commonly associated with farming and agriculture.
- Innovation was identified by less than half of students as a process related to farming.
- Just over half of the students associated scientific research and transport as processes that are related to farming.

Only 20% or 106 students reported that they were studying a school or TAFE subject in areas related to Primary Industries. Of this 20%, the most commonly reported subjects were horticulture and agriculture, followed by animal husbandry and rural studies, and marine biology.

Approximately 61% or 315 students reported that they had been able to access information about further study or careers in Primary Industries at their school.

When asked about whether they had considered further study in Primary Industry related areas:

- 15% had considered agriculture.
- 12% had considered horticulture.
- 6% had considered forestry.
- 10% had considered aquaculture.

Approximately 16% or 80 students had considered pursuing a career in the Primary Industries. The most commonly reported career area for these 80 students was agriculture, followed by farming and horticulture.

Teacher survey

Background characteristics of participating teachers

With regards to number of years teaching at their current school:

- The average for primary teachers was just over six years, while the modal response (the most common) was only one year.
- The average for secondary/central school teachers was close to seven years, while the modal response was also one year.

With regards total number of years in the teaching profession:

- For primary teachers, the average was just over 14 years, while the modal responses were three, seven and eight years.
- For secondary teachers, the average was around 15 and one half years, while the modal responses were one year and five years.

Primary Industries subjects studied by teachers at university

	Primary teachers		Secondary teachers		Total	
	n	%	n	%	n	%
Studied Agriculture subjects at university	1	5	5	16	6	11
Studied Forestry subjects at university	0	-	0	-	0	-
Studied Fisheries subjects at university	0	-	1	3	1	2
Did not study any Primary Industries subjects at university	21	96	24	77	45	85

- The vast majority of both primary and secondary teachers who responded to the survey had not studied any Primary Industries subjects while at university.
- Agriculture studies reported included Animal industries, Agriculture studies and Agricultural Economics.
- Three of the primary teachers (14%) had family working in Primary Industries.
- Seven of the secondary teachers (23%) had immediate family working in Primary Industries.

Primary Industries in the curriculum and extracurricular activities

How often do you include references to Primary Industries in the classes you teach?

	Primary teachers		Secondary teachers		Total teachers	
	n	%	n	%	n	%
Never	0	-	0	-	0	-
Rarely	5	23	2	6	7	13
Occasionally (integrated into another subject)	12	55	14	45	26	49
Regularly (integrated into another subject)	4	18	9	29	13	25
Regularly as a stand-alone subject	1	5	6	19	7	13

- According to the majority of primary teachers, references to Primary Industries are included 'occasionally' in classes, usually integrated into another subject, such as social studies, environmental studies or science.
- Only one primary teacher reported Primary Industries being included as a stand-alone subject at their school.
- Inclusion of Primary Industries was greater according to secondary teachers, with higher proportions of secondary teachers (compared to primary teachers) reporting Primary Industries being included 'regularly', either integrated into other subjects or as a stand-alone subject.
- These results are not surprising given the current status of Primary Industries subjects in the draft National curriculum (incorporated into other subjects rather than as stand-alone subjects).

How important do you think knowledge and understanding of food and fibre production is for young Australians today?

	Primary teachers		Secondary teachers		Total teachers	
	n	%	n	%	n	%
Very important	8	36	16	52	24	45
Somewhat important	14	64	12	39	26	49
Neutral - neither important nor unimportant	0	-	2	7	2	4
Unimportant	0	-	0	-	0	-
Very unimportant	0	-	1	3	1	2

- All of the responding primary school teachers saw knowledge and understanding of food and fibre production as at least somewhat important for young Australians today.
- Over half of the secondary teachers saw this knowledge and understanding as being very important for their students.

Teachers' familiarity with Primary Industries

How would you rate your own knowledge of the Primary Industries?

Familiarity with issues		Primary teachers		Secondary teachers		Total teachers	
		n	%	n	%	n	%
Agriculture	Unfamiliar with any issues in this industry	1	5	1	3	2	4
	Familiar with at least one issue in this industry	8	36	5	16	13	25
	Familiar with a few issues in this industry	10	45	14	45	24	45
	Familiar with a broad range of issues in this industry	3	14	11	35	14	26
Forestries	Unfamiliar with any issues in this industry	1	5	3	10	4	8
	Familiar with at least one issue in this industry	11	50	9	29	20	38
	Familiar with a few issues in this industry	9	41	15	48	24	45
	Familiar with a broad range of issues in this industry	1	5	4	13	5	9
Fisheries	Unfamiliar with any issues in this industry	4	18	7	23	11	21
	Familiar with at least one issue in this industry	8	36	6	19	14	26
	Familiar with a few issues in this industry	8	36	14	45	22	42
	Familiar with a broad range of issues in this industry	2	9	4	13	6	11

- Among primary teachers, familiarity was greatest in Agriculture (with 59% of teachers being familiar with 'a few' or 'a broad range' of issues), followed by Forestries (46% combined 'a few' and 'a broad range') and Fisheries (45%).
- Among secondary teachers, 80% of respondents felt that they were familiar with 'a few' or 'a broad range' of issues in Agriculture, while fewer were similar familiar with Forestries (61%) and Fisheries (58%) issues.
- Fisheries, in particular, appears to be an area in which teachers do not feel knowledgeable, with around 20% of teachers surveyed indicating that they were unfamiliar with any issues in the industry.

School activities item

Does your class or school participate in any of the following programs?

	Primary teachers		Secondary teachers		Total teachers	
	n	%	n	%	n	%
Attend Royal or local Agricultural Show Days	4	18	10	32	14	26
Compete at Royal or local Agricultural Show Days	2	9	11	35	13	25
Farm stays or visits	1	5	5	16	6	11
School vegetable gardens	18	82	18	58	36	68
Picasso Cows	2	9	0		2	4
Weed Warriors environmental programs	0		1	3	1	2
Visit Marine Discovery Centres (or similar)	5	23	4	13	9	17
None of these	4	18	7	23	11	21

- The most commonly reported activity among responding teachers, both primary and secondary, was school vegetable gardens.
- For primary school teachers, the next most common activity was visiting a Marine Discovery Centre or similar venue.
- For secondary school teachers, attendance and competition at Royal or local Agricultural Show Days (such as the Royal Brisbane Show – Ekka or Elmore Field Day) were the next most common Primary Industry-related activities.
- Participation rates in formal programs such as Picasso Cows and Weed Warriors environmental programs were quite low among the responding teachers.
- Other Primary Industry-related activities reported by the responding teachers included school-based environmental programs, revegetation projects, visits to Agricultural colleges or local industries and a World Poultry Science competition.

Key Findings

Most of the students surveyed exhibited positive attitudes towards agriculture and farming, believing that farmers take care of the soil and their animals, although they also believed that farming put wildlife at risk. When it came to understanding the origins of food and fibre, the results were quite positive, with the majority of students being able to name wheat and wool products, identify the stages in transferring fruit from an orchard to the home, or identify a product as plant-based or animal.

Interestingly, on items that were given to both Grade 6 and Grade 10 items, older students demonstrated greater understanding for only some of the items. In many instances, there was not a great difference in the proportion of students who selected the correct answer between the two grades. For instance, 61% of Grade 6 students and 64% of Grade 10 students recognised that natural fibres could be made from both plant and animal materials. Furthermore, the proportion of students who could identify that Friesian was the breed of cow grown in Australia to produce milk was around one third for both grade levels. In another interesting trend, where it would be expected that older students would be more confident in their answers, it was Grade 6 students who had higher percentages of students that were 'sure' that they had selected the correct alternative for the True or False items. On the other hand, higher proportions of Grade 10 students were able to identify the plant or animal origins of products like pasta, cotton socks, scrambled eggs, yoghurt and a pearl necklace.

Almost 90% of Grade 6 students identified that grass is important for growing wool because it is the main food of sheep whereas just over 50% knew that cheese could be made from cows', sheep or goats' milk. Grade 6 students most commonly reported a shearer when asked to note a job in relation to farming.

The majority of Grade 10 students surveyed had heard of many of the careers presented to them from the Primary Industries and 20% of these students were studying a subject related to the area. More than two-thirds of Grade 10 students reported being able to access information about careers in the Primary Industries. Approximately 16% of the older students had considered a career in the area.

While the majority of teachers who responded to the surveys indicated that teaching students about food and fibre production was important, levels of familiarity with issues related to Primary Industries were not high, particularly in Fisheries. Very few of the teachers surveyed had studied subjects related to Primary Industries while they were at university and few had immediate family members working in these industries. So how can teachers develop the knowledge and understanding needed to pass along to their students? Resources, as well as professional development opportunities, may well be an avenue by which the Primary Industries Education Foundation can seek to improve teachers' levels of knowledge about primary industries issues, and thereby increase their confidence in presenting these issues to their students.

In terms of extra or co-curricular activities, school garden programs appear to be popular and well-established among responding teachers. These could be used as a platform for promoting participation in other Primary Industry-related activities, such as farm visits, competition in local Agricultural Shows, visits to local production facilities or factories, to extend students' knowledge of the entire food production line and on a larger scale.

Appendix A: Example of Grade 6 survey

Primary Industries Education Foundation - Food, Fibre and Your Future Year 6 survey



Welcome to the **Food, Fibre and Your Future** survey.

The Primary Industries Education Foundation is interested in finding out how much you know about where food and fibre products come from, and how you learn about these things at your school.

The questions will probably take you 10 to 15 minutes to do. All of your answers are private, we won't use your name or other details in any report.

Thank you very much for helping us with this project.

There are 15 questions in this survey

Where does food and fibre come from?

1 [TF_yr6]

Peas come from the freezer...don't they?

Please read the following sentences and click on the buttons to tell us whether you think each one is True or False, and then click on a button to tell us whether you are Sure or Not sure about your answer.

Remember, you need to click on two buttons in each row! *

Please choose the appropriate response for each item:

	True	False	Sure	Not sure
Most of the logs we make in Australia come from native tree forests.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some of the basic materials for fabrics, fuels and buildings come from farms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plants are the main source of human foods.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are laws to control how many fish are caught in Australia.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The number of jobs in farming is growing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk that is straight from the cow has no bacteria in it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
90% of the sheep in Australia are the same breed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farming methods change because we have more scientific knowledge and new technology.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farmers look after the soil to keep it healthy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2 [TF_yr6b]

Please read the next group of sentences and click on the buttons to tell us whether you think each one is **True or False**, and then click on a button to tell us whether you are **Sure or Not sure** about your answer.

Remember, you need to click on two buttons in each row! *

Please choose the appropriate response for each item:

	True	False	Sure	Not sure
Farming damages the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Australia produces the same amount of wheat every year.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildlife cannot survive in an area where there is farming.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trees produce wood that can be used in building materials for houses and furniture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shearing the wool from a sheep is like cutting hair.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farmers look after their animals well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farming is necessary to grow enough food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Australia sends more food products to other countries than it receives.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There will always be plenty of seafood in the ocean.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3 [MC_cheese]Soula has a cheese sandwich and a banana in her lunchbox.



Which foods in her lunchbox come from farms? *

Please choose **only one** of the following:

- ☐ just the banana
- ☐ just the banana and the cheese
- ☐ just the bread and the banana
- ☐ all of them

**4 [MC_breeds]Some animal breeds are listed below.
Which breed is a type of cow grown in Australia to produce milk? ***

Please choose **only one** of the following:

- ☐ Angora
- ☐ Friesian
- ☐ Hereford
- ☐ Landrace

5 [MC_grass]Why is grass important for growing wool? *

Please choose **only one** of the following:

- ☐ Grass keeps sheep cool.
- ☐ Sheep like to walk on grass.
- ☐ Grass keeps down dust that can make wool dirty.
- ☐ Grass is the main food of sheep.

**6 [MC_natfibre]Georgina wants to wear clothes made only
from natural fibres.**

Where do natural fibres come from? *

Please choose **only one** of the following:

- ☐ just plants
- ☐ just animals
- ☐ both plants and animals
- ☐ just plants eaten by animals

7 [CMC_boot] Marli's favourite boots, in the picture below, are made from leather.



**Leather is an example of an animal product.
Click on one of the buttons for each item in the list to tell us if you think it is a plant product or an animal product. ***

Please choose the appropriate response for each item:

	Plant product	Animal product
pasta	<input type="radio"/>	<input type="radio"/>
cotton socks	<input type="radio"/>	<input type="radio"/>
scrambled eggs	<input type="radio"/>	<input type="radio"/>
potato chips	<input type="radio"/>	<input type="radio"/>
woollen rug	<input type="radio"/>	<input type="radio"/>
coffee	<input type="radio"/>	<input type="radio"/>
yoghurt	<input type="radio"/>	<input type="radio"/>
pearl necklace	<input type="radio"/>	<input type="radio"/>

8 [CMC_grow]

Here is a list of things we might use every day. Think about where each of these things started out from - did it grow (on a plant or animal on a farm) or was it made in a factory or laboratory?

Please click on a button to show where you think each thing came from. *

Please choose the appropriate response for each item:

	grew (from plants or animals on a farm)	made (in a factory or laboratory)
plastic	<input type="radio"/>	<input type="radio"/>
wool	<input type="radio"/>	<input type="radio"/>
glass	<input type="radio"/>	<input type="radio"/>
cardboard	<input type="radio"/>	<input type="radio"/>
cooking oil	<input type="radio"/>	<input type="radio"/>
cotton wool	<input type="radio"/>	<input type="radio"/>
lycra	<input type="radio"/>	<input type="radio"/>
sugar	<input type="radio"/>	<input type="radio"/>

9 [CMC_milk] Cheese can be made from: *

Please choose **only one** of the following:

- ☐ Milk from cows
- ☐ Milk from sheep
- ☐ Milk from goats
- ☐ All of the above
- ☐ None of the above

10 [Job_SR] A person who works on a farm is called a farmer, but there are many other people who work on farms or with farmers.

Write the name of one other job that is related to farming.

Please write your answer here:

11 [Job_MC] Does anyone in your family work in these sorts of jobs? *

Please choose **all** that apply:

- ☐ Farming to grow food or fibre (Agriculture)
- ☐ Timber production (Forestry)
- ☐ Fisheries and seafood farming (Aquaculture)
- ☐ None of these

12 [Program_MC] Have you and your class done any of these things at your school this year?

If you are not sure, ask your teacher. *

Please choose **all** that apply:

- ☐ Went to Royal or local Agricultural Show (e.g. Elmore Field Day, Royal Brisbane Show - Ekka)
- ☐ Competed in Royal or local Agricultural Show
- ☐ Visited or stayed at a farm
- ☐ Grew a vegetable garden at school
- ☐ Participated in Picasso Cows
- ☐ Participated in Weed Warriors environmental programs
- ☐ Visited a Marine Discovery Centre
- ☐ None of these
- ☐ Other:

About you

13 [D1]Are you...? *

Please choose **only one** of the following:

- ☐ Female
☐ Male

14 [D2]Where do you go to school? *

Please choose **only one** of the following:

- ☐ Australian Capital Territory (ACT)
☐ New South Wales
☐ Victoria
☐ Queensland
☐ South Australia
☐ Western Australia
☐ Tasmania
☐ Northern Territory

15 [D3]What is the full name of your school?

You can check with your teacher if you aren't sure about the full name. *

Please write your answer here:

Appendix B: Example of Grade 10 survey

Primary Industries Education Foundation - Food, Fibre and your Future Welcome to the Primary Industries Education Foundation (PIEF) Food, Fibre and Your Future Year 10 survey



Welcome to the Primary Industries Education Foundation (PIEF) Food, Fibre and Your Future survey. The Primary Industries Education Foundation is a public, not for profit company established as a collaboration between Primary Industries, the government and the education sector. Their aim is to support and improve education about Primary Industries in Australian schools.

ACER has been employed by PIEF to conduct this online survey of students to find out how much you know about where food and fibre products come from, how aware you are of careers opportunities in the Primary Industries, and what experiences you have had of Primary Industries education at your school.

In the survey, when we talk about Primary Industries, we are talking about Agriculture, Forestry and Fisheries.

The survey should only take 10 to 15 minutes to complete. Your responses are confidential and no teacher, student or school will be identified in any report. We greatly appreciate your contribution to this project.

There are 23 questions in this survey

Food and Fibre production

1 [TF_yr10]

Peas come from the freezer...don't they?

Please read the following statements and indicate whether you think each one is **True or False**, and then whether you are **Sure or Not sure** about your answer.

Please choose the appropriate response for each item:

	True	False	Sure	Not sure
Most logs harvested in Australia come from native tree forests.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some raw materials for fabrics, fuels and buildings come from farms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are laws to control how many fish are caught in Australia.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The number of jobs in Agriculture is growing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Homogenised milk has no bacteria in it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
90% of the sheep in Australia are the same breed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farming methods change due to increase in scientific knowledge and developments in technology.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forests can be managed to produce wood at the same time as protecting the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2 [TF_yr10b]

Please read the next group of statements and indicate whether you think each one is True or False, and then whether you are Sure or Not sure about your answer.

Remember, you should click on two buttons in each row.

Please choose the appropriate response for each item:

	True	False	Sure	Not sure
Sustainable farming keeps the soil fertile.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using pesticides to kill insects has increased the amount of food grown on farms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farming damages the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Australia produces the same amount of wheat every year.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildlife cannot survive in an area where there is farming.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farm products are important to the Australian economy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk cartons are a forestry product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Australia exports more food products than it imports.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There will always be plenty of seafood in the ocean.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3 [CMC_2] Marli's favourite boots, in the picture below, are made from leather. Leather is an example of an animal product.



4 [CMC_3]

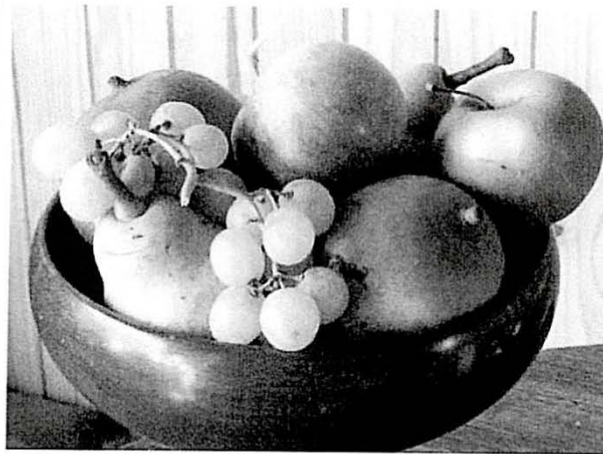
Below is a list of everyday items. Think about where each of these things started out from - did it grow (on a plant or animal on a farm) or was it made in a factory or laboratory?

Please click on a button to show where each item came from.

Please choose the appropriate response for each item:

	grew (from plants or animals on a farm)	made (in a factory or laboratory)
plastic	<input type="radio"/>	<input type="radio"/>
wool	<input type="radio"/>	<input type="radio"/>
glass	<input type="radio"/>	<input type="radio"/>
cardboard	<input type="radio"/>	<input type="radio"/>
cooking oil	<input type="radio"/>	<input type="radio"/>
cotton wool	<input type="radio"/>	<input type="radio"/>
lycra	<input type="radio"/>	<input type="radio"/>
sugar	<input type="radio"/>	<input type="radio"/>
aluminium foil	<input type="radio"/>	<input type="radio"/>

5 [CMC_4]The fruit bowl below has apples, pears, grapes and mangoes in it.



How did the fruit travel from the fruit orchard to the bowl on the table?

Put the stages in the correct order by putting numbers in the boxes next to each stage.

The orchard is the first stage, so put a 1 in the box next to it. What comes next?

Please write your answer(s) here:

Orchard

Fruit Bowl

Refrigerated truck

Packing shed

Fruit shop

6 [CR_6]Mens' suits are an example of a product made from Australian wool.

Name two other wool products.

**7 [CR_7]Bread is an example of a product made from Australian wheat.
Name two other wheat products.**

Please write your answer here:

8 [CMC_8]Georgina wants to wear clothes made only from natural fibres.

Where do natural fibres come from?

Please choose **only one** of the following:

- ☐ just plants
- ☐ just animals
- ☐ both plants and animals
- ☐ just plants eaten by animals

9 [CMC_10]Trees are often grown in plantations where all of the trees are the same kind.

The most important role for tree plantations is to...

Please choose **only one** of the following:

- ☐ provide homes for wildlife
- ☐ preserve the land beneath the trees
- ☐ give shelter to cattle and sheep
- ☐ produce good quality timber

**10 [MC_breeds]Some animal breeds are listed below.
Which breed is a type of cow grown in Australia to produce milk?**

Please choose **only one** of the following:

- ☐ Angora
- ☐ Friesian
- ☐ Hereford
- ☐ Landrace

11 [MC_fish] Which of these seafood species are farmed in Australia?

Please choose the appropriate response for each item:

	Yes, farmed	No, not farmed
Barramundi	<input type="radio"/>	<input type="radio"/>
Atlantic salmon	<input type="radio"/>	<input type="radio"/>
Prawns	<input type="radio"/>	<input type="radio"/>
Oysters	<input type="radio"/>	<input type="radio"/>
Eels	<input type="radio"/>	<input type="radio"/>

Careers and education in Primary Industries

12 [CR_1] Which of the careers on the list below have you heard of, or know something about?

Please choose the appropriate response for each item:

	I've heard of this job	I haven't heard of this job	I know a bit about this job	I don't know anything about this job
fish farming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
land management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
irrigation engineer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
animal husbandry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
horticulturalist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
veterinarian	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
plant breeder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
wool classer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
apiarist/beekeeper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
orchardist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13 [CR_2] Which processes on the list do you associate with farm products or agriculture?

Please choose the appropriate response for each item:

	Associated with farm products	Not associated
harvesting	<input type="radio"/>	<input type="radio"/>
scientific research	<input type="radio"/>	<input type="radio"/>
innovation	<input type="radio"/>	<input type="radio"/>
transport	<input type="radio"/>	<input type="radio"/>
hygiene	<input type="radio"/>	<input type="radio"/>
sales	<input type="radio"/>	<input type="radio"/>
distribution	<input type="radio"/>	<input type="radio"/>
quality control	<input type="radio"/>	<input type="radio"/>
processing	<input type="radio"/>	<input type="radio"/>
genetic modification	<input type="radio"/>	<input type="radio"/>

14 [CR_3] Are you currently studying any school or TAFE subjects in areas related to Primary Industries (e.g. Agriculture, Horticulture, Forestry, Equine Industries, Fisheries, etc)?

Please choose only one of the following:

☐ Yes

☐ No

15 [CR_3a] Please list these subjects in the space provided...

Only answer this question if the following conditions are met:

° Answer was 'Yes' at question '14 [CR_3]' (Are you currently studying any school or TAFE subjects in areas related to Primary Industries (e.g. Agriculture, Horticulture, Forestry, Equine Industries, Fisheries, etc)?)

Please write your answer here:

16 [CR_6] Have you been able to access information about further study or careers in Primary Industries at your school?

Please choose only one of the following:

☐ Yes

☐ No

17 [CR_4] Have you considered doing any further study in the following areas?

Please choose all that apply:

- ☐ Agriculture (farming to produce food and/or fibre)
- ☐ Horticulture (growing plants)
- ☐ Forestry (timber and associated products production)
- ☐ Aquaculture (fisheries)

Primary Industries (agriculture, fisheries or forestry)?

Please choose only one of the following:

- ☐ Yes
☐ No

19 [CR_5a] In which area of Primary Industries are you considering a career?

Only answer this question if the following conditions are met:

° Answer was 'Yes' at question '18 [CR_5]' (Have you considered pursuing a career in the Primary Industries (agriculture, fisheries or forestry)?)

Please write your answer here:

20 [CR_7] Does anyone in your extended family work in these Primary Industries?

Please choose all that apply:

- ☐ Agriculture/Farming
☐ Fisheries
☐ Forestry

About you

21 [D1]Are you...?

Please choose **only one** of the following:

- ☐ Female
- ☐ Male

22 [D2]

In which state do you go to school?

Please choose **only one** of the following:

- ☐ Australian Capital Territory (ACT)
- ☐ New South Wales
- ☐ Victoria
- ☐ Queensland
- ☐ South Australia
- ☐ Western Australia
- ☐ Tasmania
- ☐ Northern Territory (NT)

23 [D3]What is the full name of your school?

We will use this information only to link students' responses to their teachers' responses, not to identify you or your school.

Please write your answer here:

Appendix C: Example of Teacher survey

Primary Industries Education Foundation (PIEF) - Food, Fibre and the Future teacher survey



Welcome to the Primary Industries Education Foundation (PIEF) **Food, Fibre and the Future** survey for Australian teachers. The Primary Industries Education Foundation is a public, not for profit company established as a collaboration between the Primary Industry, government and education sectors. It aims to embed, improve, enhance and support Primary Industries education in Australian schools.

ACER has been commissioned by PIEF to conduct this online survey of classroom teachers, which focuses on awareness and experiences of the Primary Industries in education. The survey for students focuses on their awareness of where food and fibre products come from, careers opportunities in the Primary Industries, and their experiences of Primary Industries in schools.

Primary Industries, in this context, includes Agriculture, Forestry and Fisheries.

The survey should only take 10 to 15 minutes to complete. Individual responses are confidential and no teacher, student or school will be identified in any report.

We greatly appreciate your contribution. This is an important opportunity for teachers to provide feedback about the place of Primary Industries in Australian education.

There are 15 questions in this survey

About you

1 [T1]Are you... *

Please choose **only one** of the following:

- ☐ Female
☐ Male

2 [T2]What is the name of the school at which you are currently teaching? Please include campus information if relevant.

Please note, this information is used only to link teacher and student responses, no school will be identified in any report. *

Please write your answer here:

3 [T3]For how many years have you been teaching at this school?

If you have been teaching at the school for less than 1 year, please round this up to 1 year.

Please write your answer here:

4 [T4]For how many years have you been teaching overall?

If you have been teaching for less than 1 year, please round this up to 1 year.

Please write your answer here:

5 [T5]Did you study any Primary Industries subjects while at university?

If you have studied subjects from one or more of these areas, please list them in the space provided. *

Please choose all that apply and provide a comment:

☐ Agriculture subjects

☐ Forestry subjects

☐ Fisheries subjects

☐ No Primary Industries subjects

Other:

6 [T6]Does anyone in your immediate family work in Primary Industries? *

Please choose **only one** of the following:

☐ Yes

☐ No

Primary Industries in the school curriculum

7 [T7] How often do you include references to Primary Industries in the classes that you teach?

Remember, Primary Industries includes agriculture, forestry and fisheries. *

Please choose **only one** of the following:

- ☐ Regularly, as a stand alone subject, e.g. agricultural studies
- ☐ Regularly, integrated into another subject, e.g. social studies, science or environmental studies
- ☐ Occasionally, integrated into another subject, e.g. social studies, science or environmental studies
- ☐ Rarely
- ☐ Never

8 [T8] How would you rate your own knowledge of the Primary Industries? *

Please choose the appropriate response for each item:

	Unfamiliar with any issues	Familiar with at least one issue	Familiar with a few issues	Familiar with broad range of issues
Agriculture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forestry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fisheries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9 [T9] Does your class or school participate in any of the following programs? *

Please choose **all** that apply:

- ☐ Attendance of Royal or local Agricultural Show Days (e.g. Elmore Field Day, Royal Brisbane Show - Ekka)
- ☐ Competition in Royal or local Agricultural Show Days
- ☐ Farm stays or exchanges
- ☐ School vegetable gardens
- ☐ Picasso Cows
- ☐ Weed Warriors environmental programs

☐ None of these

☐ Other:

10 [T10] How important do you think knowledge and understanding of food and fibre production is for young Australians today? *

Please choose **only one** of the following:

- ☐ Very important
- ☐ Somewhat important
- ☐ Neutral - neither important nor unimportant
- ☐ Unimportant
- ☐ Very unimportant

Web resources for Primary Industries education

PIEF is currently developing a web portal of resources and initiatives for teachers and students, thereby encouraging and supporting the teaching and learning of Primary Industries in Australian schools.
The next set of questions seek your opinion on how this web portal should be organised.

**11 [TW1]As a teacher, how would you most like the resources and information on the PIEF education website to be arranged?
By....**

Please choose **only one** of the following:

- ☐ Key learning areas (KLAs)
- ☐ Year levels
- ☐ Careers
- ☐ Australian Curriculum content descriptions
- ☐ Type of primary industry
- ☐ Other

12 [TW2]In what format would you prefer the resources to be provided?

Please choose **all** that apply:

- ☐ Downloadable PDF documents
- ☐ Downloadable Word documents
- ☐ Multi media
- ☐ Slideshows or Powerpoint presentations
- ☐ Interactive formats, such as learning objects or games
- ☐ Other:

13 [TW3]What information and resources would you expect to find within such a web portal?

Please choose **all** that apply:

- ☐ Teaching and learning activities on primary production and processing of commodities, such as food, fibre or energy (e.g. the paddock to plate concept)
- ☐ Information about Primary Industry interaction and relationships
- ☐ Primary Industry statistics
- ☐ Background documents such as summaries of Primary Industry reports
- ☐ Information about career opportunities and pathways in Primary Industries
- ☐ Teacher professional development modules
- ☐ News alerts
- ☐ Discussion groups
- ☐ Primary Industries video and audio materials
- ☐ Other:

14 [TW4]How often would you anticipate referring to such a web portal for information and resources?

Please choose **only one** of the following:

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Yearly
- ☐ Never

15 [TW5]Would you subscribe to a service in which you are contacted by the web portal when new materials or information are added?

Please choose **only one** of the following:

- ☐ Yes
- ☐ No