

## Developing critical thinking skills 1:

Is there a cause–effect relation in the following?

1 Sam's whole family was ill last night. It's because they all had fish at the restaurant.

2 Susan doesn't eat meat or fish. She's a vegetarian.

3 Jane doesn't play any musical instruments. Therefore she isn't a musician.

4 My aunt's first child slept through the night but her second one didn't. So first-born children sleep better.

5 My little brother hates greens. So does his best friend. It's clear that small children don't like vegetables.

6 Sharks, whales and dolphins live in the sea and can swim. Therefore they are fish.

7 Ice hockey players wear helmets for protection.

8 The lake froze because the temperature was minus 15° C.

## Developing critical thinking skills 2:

**Label each statement with Fact, Wrong or Opinion.**

Fact: what can be proven to be true

Opinion: a personal belief

Wrong: what can be proven to be untrue

- 1 The koala is one of the sweetest animals.
- 2 Koalas are bears.
- 3 Koalas feed on the leaves of the Eucalyptus tree. These leaves are poisonous to many other animals.
- 4 Koalas have a special digestion system that enables them to eat Eucalyptus tree leaves.
- 5 Everybody likes seeing a koala.
- 6 Koalas are found living wild in coastal regions of eastern and southern Australia, and in northern India.
- 7 When people see a koala, the first thing they think of is a teddy bear.
- 8 Seeing a koala mother with her baby on a Sunday brings good luck.
- 9 People who injure or kill a koala in a road accident are brutal.
- 10 In some areas koalas are endangered, and they deserve to be protected.
- 11 Many koalas have been captured and sold to zoos overseas, but unfortunately most die within a few weeks.
- 12 Today, very few zoos and nature parks outside Australia have koalas.

## Developing critical thinking skills 3:

**Identify the invalid conclusions and say why they are invalid.**

- 1 In Europe, you have to be 18 to get a driving licence. Carla is from Rome and she turned 18 yesterday. So she can now drive a car.
- 2 Apples are very healthy fruit. I eat 2 apples a day. That's healthy eating behaviour.
- 3 Paula has over 3,000 friends on Facebook and 2,000 on Twitter. So she must be a member of all the social media on the web.
- 4 Some Woody Allen films are fantastic. *Midnight in Paris* is a Woody Allen film. So *Midnight in Paris* is a fantastic film.
- 5 The chef of that restaurant is famous for his fish soup. Jane often eats there. So she often eats fish soup.
- 6 Taxi drivers make money from driving people around town. I often go by taxi. So taxi drivers make money from me.
- 7 Educated people should try to solve problems in a peaceful way. Tony went to university. Therefore he would never get into a fight.
- 8 Tina is blonde and her skin gets irritated very easily. She is going on a summer holiday to Brazil. So she needs to protect her skin against the sun.
- 9 Some babies have an allergy to cows' milk. My sister's son is 5 months old. He doesn't have an allergy. So he can drink cows' milk.
- 10 Easterly winds often bring rain in my country. Today it's raining. Hence there must be wind from the east.

## **Developing critical thinking skills 4:**

**Change the sentences so they make sense.**

- 1 Always wash a banana before you eat it.
- 2 They watched the show on the radio.
- 3 He bought a new modem to connect to the water pipe.
- 4 It's starting to rain. Let's take a towel along.
- 5 I used a dictionary to check the meaning of the traffic signs.
- 6 Canada is further away from the USA than from Africa.
- 7 She's very fit. She never does any sport.
- 8 We're both thirsty. Let's stop playing for a moment and eat some biscuits.
- 9 When he kicked the bicycle, it bounced off the wall and rolled down the hill.
- 10 She eats a lot of ice cream, even in winter. She just loves hot stuff.
- 11 There are lots of wind farms in California. They produce about 5% of the country's wind.
- 12 She always uses her flip cam to read her emails.
- 13 He phoned me twice to say that he was calling from an area where no phone works.
- 14 It was so cold that people were not allowed to water their gardens or wash their cars.
- 15 I don't fancy him at all. I do hope he will phone me and ask me out for dinner.

## **Developing critical thinking skills 5:**

**Divergent thinking – how many answers can you find?**

**You will get extra points for your most original answers!**

- 1 What weighs more than it did half a year ago?
- 2 What looks different when it is cold than when it is hot?
- 3 What would you not cut with a knife?
- 4 What can you identify by its smell with your eyes closed?
- 5 What can you do at school, but not at home?
- 6 What can cats do that people can't?
- 7 What do you smell in the morning, but not at night?
- 8 What stays hot all winter?
- 9 What are things money can't buy?
- 10 What have teachers and car mechanics in common?
- 11 What can you use to protect yourself against the sun?
- 12 What's your most creative excuse for not handing in your homework?
- 13 In what situations should you always wash your hands first?
- 14 What would the world be like without money?
- 15 What would you never eat with salt?
- 16 What 3 personal things would you take with you on an expedition to the North Pole?

## Comments and suggested answers

### Handout 1:

Throughout this activity, students are learning to decide whether there is a cause–effect relation between the bits of information given. Key questions for the students are:

1. Is there enough information given so that it can be proven there is a cause–effect relation?
2. If there is not enough information given – what other information would I need in order to prove a cause and effect relation?

### Answers

- 1 No cause–effect relation; not enough information given to prove this.
- 2 Cause–effect relation; sufficient information is given.
- 3 No cause–effect relation; not enough information given to prove this; Jane could be a composer (which would make her a musician) without playing an instrument.
- 4 No cause–effect relation; it’s an over-generalisation.
- 5 No cause–effect relation; it’s an over-generalisation.
- 6 No cause–effect relation; it’s an over-generalisation. Whales and dolphins live in water and can swim, but they are mammals, not fish.
- 7 Cause–effect relation, sufficient information given.
- 8 Cause– effect relation, sufficient information given.

### Handout 2:

Learning to differentiate between fact and opinion is one of the basic requirements for developing critical thinking skills. This worksheet gives students practice in that skill. In addition, students are learning to consider whether what is presented as a fact is actually true. In order to prove whether something is a fact or not, they might need to check by consulting the web, an encyclopaedia or other sources.

### Answers

- 1 Opinion (watch out for words such as *sweet, beautiful, lovely* etc. These usually give evidence of the speaker’s opinion).
- 2 Wrong information (koalas are marsupials, whereas bears are placental mammals).
- 3 Fact.
- 4 Fact.
- 5 Opinion (watch out for words such as *people, everybody, everywhere* etc. – most times, they don’t give you precise information).
- 6 Wrong (koalas don’t live naturally in any country other than Australia).
- 7 Opinion.
- 8 Opinion.
- 9 Opinion (this could be a fact for a specific case of somebody killing a koala in a road accident, but doesn’t hold as general truth – an incident like this could happen without it being the driver’s fault)
- 10 The first part of the sentence is a fact, but the second part is an opinion (the speaker thinks that they ‘deserve’ to be protected; although most people would agree with that, it’s still an opinion).
- 11 Fact.
- 12 Fact.

### Handout 3:

Students need to learn to analyse whether a conclusion drawn by someone is actually valid. The key point here is that they understand that the conclusion must follow logically from the information given. A conclusion is not valid if we need to make assumptions about facts that are not part of the information.

#### Answers

- 1 Invalid conclusion. It doesn't say that she actually has a driving licence. She is old enough to get one now, but she is not allowed to drive without one.
- 2 Valid conclusion.
- 3 Invalid conclusion. Paula is obviously a member of Facebook and Twitter, but there is no information about her membership of other social networks.
- 4 Invalid conclusion. The text says that some Woody Allen films are fantastic, but doesn't say anything about the quality of *Midnight in Paris*.
- 5 Invalid conclusion. There is no information on what Jane eats when she goes to the restaurant.
- 6 Valid conclusion.
- 7 Invalid conclusion. The fact that educated people 'should' try to solve problems peacefully does not lead to the conclusion that they all do.
- 8 Valid conclusion.
- 9 Invalid conclusion. We know that the 5-month old doesn't have an allergy, but he could have other medical conditions that could make it impossible for him to drink cows' milk.
- 10 Invalid conclusion. The text says that easterly winds 'often' bring rain. That doesn't mean that rainfall is necessarily caused by an easterly wind.

### Handout 4:

This is a fun activity aimed at getting students to recognise nonsense sentences and use their logical thinking to get the sentences right. The activity can be done as a game.

- 1 Cut the sentences up and put them in a bag.
- 2 Students take turn in taking a sentence out of the bag.
- 3 Each student reads out their sentence. They say the name of a student who should correct the sentence. This should be done at a fast pace.
- 4 If that student does that correctly, they get a point for each correct sentence.
- 5 Then, other students can make suggestions for other correct versions of the sentence, and get a point for each correct version. The student with the most correct sentences is the winner.

Suggestions for correct versions (note that with most of these sentences, there are – sometimes several – other possible answers):

- 1 Always peel a banana before you eat it.
- 2 They watched the show on TV.
- 3 He bought a new modem to connect to the Internet.
- 4 It's starting to rain. Let's take an umbrella along.
- 5 I used a dictionary to check the meaning of the words.
- 6 Canada is further away from Africa than from the USA.
- 7 She's very fit. She does a lot of sport.
- 8 We're both hungry. Let's stop playing for a moment and eat some biscuits.
- 9 When he kicked the ball, it bounced off the wall and rolled down the hill.

- 10 She eats a lot of ice cream, even in winter. She just loves cold stuff.
- 11 There are lots of wind farms in California. They produce about 5% of the country's energy.
- 12 She always uses her mobile phone to read her emails.
- 13 He phoned me twice to say that he would be moving into an area where no phone works.
- 14 It was so dry that people were not allowed to water their gardens or wash their cars.
- 15 I fancy him a lot. I do hope he will phone me and ask me out for dinner.

Follow-up activity:

- 1 Ask each student to create ten 'meaningless' sentences.
- 2 Students work in pairs. They swap their sentences and take turn putting each other's sentences right.

### **Handout 5:**

This handout helps develop students' divergent thinking, their ability to think 'outside the box'. Use one example from the handout to show students what the purpose of the activity is. Use the first question *What weighs more than it did half a year ago?* to show students that there are many possible answers, e.g.

*a lamb, a baby, my friend Chris because he loves eating ice cream and eats at least one ice cream a day etc.*

Encourage students to find as many answers as possible, and praise them especially for fun and unexpected ideas. Then choose 2 or 3 statements, put students in groups and get them to brainstorm answers. Give extra points for very creative ideas.

The ideas on the worksheet can be used for several subsequent sessions. This may be better than using them all in one lesson, as the more the students get used to this kind of task the more creative they will become, gradually developing their divergent thinking.