

## **Structured Abstract**

**Background:** Much of the evidence underlying guidelines for producing accessible information for people with aphasia focusses on client preference for particular design features. There is limited evidence regarding the effects of these features on comprehension.

**Aims:** This study aimed to examine the effects of specific design features on text comprehension. It was hypothesised that font style, letter case and supporting images would all have a significant impact on people with aphasias' ability to comprehend text.

**Methods and Procedures:** Participants (N = 9) read 35 paragraphs and selected the most appropriate word or phrase from a choice of four to finish the final sentence. Reading comprehension was assessed in three conditions; font style, letter case and text with a supporting image. One-way ANOVAs with Bonferroni post-hoc tests were used to test the effect of each design feature on reading comprehension.

**Outcomes and Results:** People with aphasia comprehended significantly more written information when presented in sans serif font than in a serif style ( $p = 0.01$ ) and when presented in lower case than in upper case ( $p = 0.03$ ). The inclusion of a single supporting image to illustrate a paragraph of text did not have a significant effect on comprehension.

**Conclusions and Implications:** This research supports the premise that font style and letter case have a significant effect on text comprehension, but that illustrating a paragraph of text with a single image may not significantly improve comprehension when text is written at a low readability level. Although it is critical to produce accessible information, improving

comprehension is only one rationale for modified text presentation and therefore these results must be viewed in the context of other recommendations.

## **Introduction**

People with aphasia frequently present with impaired reading comprehension. Access to a wide range of services is dependent on the ability to understand written materials and consequently, inaccessible information can limit participation and have a significant impact on a person's quality of life (Parr, 2007). It is therefore crucial that those with aphasia are provided with written materials they are able to understand.

One of the most thorough guides to producing accessible written information (Herbert et al., 2012), makes a series of recommendations about content and design features, such as the use of short sentences, simple vocabulary, sans serif font and clear images to match linguistic content. The evidence-base for current guidance largely originates from qualitative studies that have investigated the preferences and opinions of people with aphasia (Rose et al., 2011a, Rose et al., 2012, Eames et al., 2003). Rose et al., (2011a) conducted semi-structured interviews with 40 people with aphasia and found that most participants stated a preference for the inclusion of images, sans serif fonts and large font size. In a further study, most participants felt that images were helpful, particularly photographs (Rose et al., 2012). Small font size, poorly organised information and a lack of images have been judged by people with aphasia to make information more difficult to understand (Eames et al., 2003).

Whilst these studies have succeeded in identifying design preferences, it is widely acknowledged that further evidence needs to be gathered in terms of whether or not these features actually aid accessibility and comprehension of written information (Rose et al., 2012, Rose et al., 2011a). A small number of studies have investigated this issue, testing a range of design features. Rose et al., (2003) presented 12 participants with aphasia with published health brochures and assessed their knowledge of key facts before and after reading the materials. Each brochure was presented in an un-adapted format and an aphasia-friendly format that contained simple words, short sentences, large standard font, white space and relevant pictures. Knowledge increased after reading the original brochures, however the participants comprehended 11.2% more by reading the aphasia-friendly versions. In spite of this, 40.6% of the participants expressed a preference for brochures in their original formats.

Individual design features have also been investigated to determine their specific effects on comprehension. The use of graphics to support comprehension is perhaps the most researched adaptation, however, current evidence is inconclusive. Brennan et al., (2005) reported that the addition of Microsoft ClipArt images to support text led to a small, but non-significant improvement in comprehension. Dietz et al., (2009) found that photographs had a significantly positive effect on reading comprehension, measured by asking seven participants with aphasia to read a series of narratives and answer related sets of comprehension questions. In contrast, Rose et al., (2011b) reported that in their study of 22 people with aphasia, neither line drawings nor photographs, had a significant effect on the comprehension of written paragraphs.

There is very little evidence about the effect of typography on accessibility, though guidelines published by the Stroke Association promote the use of sentence-case (Herbert et al., 2012), in which the first word and proper nouns are capitalised. Consistent use of upper case in written health information has been shown to decrease the reading speed of the general public (Bernier, 1993) and hinder the comprehension of people with low literacy levels (Badarudeen and Sabharwal, 2010). There are comparatively few studies that specifically investigate the effect of letter case for those with aphasia, however a study investigating internet accessibility recommended avoiding ‘unnecessary use of capitals’ (Elman et al., 2003). In contrast, a small number of participants in the Rose et al., (2011a) study reported that use of capital letters may be helpful in emphasising key information. The Stroke Association Guidelines (Herbert et al., 2012) advocate the use of sans-serif font, which is consistent with the typography preferences of people with aphasia, reported in Rose et al., (2012). However there is limited evidence to suggest that sans-serif fonts have a measurable impact on how people with aphasia comprehend text.

This study aims to extend the work of Brennan et al., (2005) by examining the effect of three individual design characteristics on the reading comprehension of people with aphasia. Font style, letter case and the use of images are all recommended by the Stroke Association (Herbert et al., 2012) as adaptations that increase accessibility to written information for people with aphasia, however there is limited empirical evidence to support these recommendations. Specifically, the hypotheses under investigation are that people with aphasia will comprehend significantly more information from text written at grade 6 readability level when presented; 1) in sans serif font than in serif or script font style, 2) in sentence case than in upper case, 3) with a single supporting image per paragraph of text, than with no image.

### **Methods and procedures**

Nine participants (table 1) aged between 63 and 78 (mean age = 71.9 years) were recruited through a stroke support group. All had a diagnosis of mild-moderate aphasia (confirmed by a speech and language therapist) and participants with corrected vision were included. Prior to initial testing, all participants completed a reading screen of 15 words from Subtest 31 of the PALPA (Psycholinguistic Assessment of Language Processing in Aphasia) (Kay et al., 1992). The stimuli were selected to represent a range of frequency, imageability, regularity and word length.

TABLE 1. Participant information

Participant number	Gender	Age (years)	Reading screen (number of words read aloud correctly)
1	M	77	14/15 (Error: pint → 'print')
2	M	78	15/15
3	F	71	15/15

4	M	78	15/15
5	F	72	15/15
6	M	63	14/15 (Error: tomb → 'comb')
7	M	69	15/15
8	F	68	15/15
9	M	71	15/15

All participants were recruited following University Ethics Committee guidance, ensuring that informed consent was gained prior to participation, and the right to withdraw without reason and repercussions was explained.

Based on previous research (Brennan et al., 2005, Rose et al., 2011b), participants were presented with 35 paragraphs taken from the Scientific Research Associates *Reading for Understanding* series (Thurstone, 1990). In order to reduce the potential for mismatched groups, the 35 paragraphs were randomly allocated to each of the seven conditions (table 2), with a total of 5 paragraphs in each condition.

TABLE 2. Paragraph formats in each test condition

Condition	Font Style	Letter Case	Supporting Images	Font size	Spacing
1. Standard	Times New Roman	Sentence	None	14pt	Single
2A. Font	<b>Verdana</b>	Sentence	None		
2B. Font	<b>Harrington</b>	Sentence	None		
3A. Letter Case	Times New	<b>All upper case</b>	None		

	Roman				
3B. Letter Case	Times New Roman	<b>Upper case for key words</b>	None		
4A. Images	Times New Roman	Sentence	<b>Coloured photograph</b>		
4B. Images	Times New Roman	Sentence	<b>Coloured line drawing</b>		

Paragraphs (see Appendix) were selected to represent a wide range of topics to reduce the influence of participant interest and knowledge and paragraph length was calculated across the conditions. Readability grade levels were calculated using the Flesch-Kincaid grade level tool (Flesch, 1948) since readability level has been shown to influence comprehension (Pothier et al., 2008). There was no significant difference across the seven conditions in terms of terms of readability ( $f = .159$ ,  $p = 9.87$ ) or paragraph length ( $f = .245$ ,  $p = .961$ ), demonstrating that these factors were matched across the test conditions (table 3). The mean readability score was 6.67; consistent both with the recommendation that level 6 is the most appropriate for participants with unknown reading abilities (Doak et al., 1996) and with the reading level used in Rose et al., (2011b).

TABLE 3. Mean readability (Flesch-Kincaid) and paragraph length in words

Design condition	Mean readability	Mean paragraph length in words
Standard	6.573 (.582)	35.6 (10.41)
Verdana	6.547 (.559)	34 (9.09)
Harrington	6.622 (.594)	35.98 (9.95)
All upper case	6.549 (.584)	35.82 (10.33)
Caps for keywords	6.602 (.564)	35.20 (10.18)
Photograph	6.520 (.592)	35.53 (8.17)
Clipart	6.567 (.622)	36.07 (8.59)

Aphasia-friendly adaptations (Brennan et al., 2005, Herbert et al., 2012) were not included in the standard text condition. In each of the remaining six conditions, only one design

characteristic was changed in order to isolate whether each particular feature influenced reading comprehension. There were three categories of variables; font, letter case and images, selected on the basis that these design features appear prominently within current guidelines for producing aphasia-friendly written materials (Herbert et al., 2012), but with limited empirical evidence of their measurable effect on comprehension. Sans serif fonts have been rated as easier to read than serif fonts (Rose et al., 2012); Verdana and Harrington were used to represent each font style in the present study. There is limited and inconsistent evidence of the effect of letter case (Rose et al., 2011a, Hoffman and Worrall, 2004), therefore the effect of sentence case, upper case and upper case for key words were investigated. The use of coloured supporting photographs and coloured ClipArt line drawings were selected in order to extend existing research into the effect of supporting images (Dietz et al., 2009, Brennan et al., 2005). The images were deemed high quality by two independent judges and were selected to represent a key noun from each paragraph e.g. rainbow. These images represented the same concept in each condition and response options were not supported by images.

Participants read each paragraph and were asked to select the most suitable final word or phrase from a choice of four. Correct answers were awarded a score of one and a score of zero was given if the participant was unable to answer or answered incorrectly. To eliminate any effects of fatigue, participants carried out the task over two sessions on separate days, each lasting approximately 15-20 minutes. The paragraphs themselves were presented in the same order to each participant; however, the paragraphs were randomly allocated across the seven conditions in order to prevent fatigue or practice becoming confounding factors. A one-way ANOVA with post-hoc testing and a linear regression was performed for each of the three independent variables to determine whether there was a significant effect on reading comprehension.



## **Outcomes and Results**

The mean number of paragraphs that generated a correct response and the standard deviation was calculated for each condition (table 4), with a maximum possible score of five in each condition.

TABLE 4. Standard deviation and mean number of paragraphs correct for each condition

Condition	Mean (max = 5)	Standard deviation
1. Standard (Times New Roman)	3.33	0.87
2A. Font: verdana	4.44	0.53
2B. Font: Harrington	2.56	1.13
3A. Letter Case: all upper case	2.00	1.22
3B. Letter Case: upper case for key words	2.89	0.93
4A. Images: coloured photograph	4.00	1.19
4B. Images: coloured Microsoft Clip-Art	3.22	0.97

The data were within the acceptable bounds of normal distribution, therefore ANOVA with post-hoc tests and linear regressions were performed (table 5).

TABLE 5. Results of ANOVA and regressions for each variable

Variable	F	p value	Linear trend
Font	F(2,16) = 10.55	0.01	F(1,8) = 23.59, p = 0.01 Verdana > Standard (Times New Roman) > Harrington
Letter case	F(2,16) = 4.00	0.032	F(1,8) = 10.67, p = 0.011 Standard (Sentence) > upper case keywords > upper case
Images	(F(2,16) = 2.48	0.135	N/A

Within the font condition, the mean number of paragraphs correct was greatest for Verdana (sans serif), followed by Times New Roman (serif) then Harrington (serif). There was a

significant effect of font ( $F(2,16) = 10.55, p = .01$ ). Post-hoc testing showed no significant difference between Times New Roman (TNR) and Harrington ( $p = .101$ ), however comprehension was significantly better when text was presented in Verdana compared to TNR ( $p = .021$ ) and Harrington ( $p = .000$ ).

There was a significant effect of letter case on reading comprehension ( $F(2,16) = 4.00, p = 0.032$ ). Post-hoc testing revealed a significant difference between sentence case and all upper case ( $p = .006$ ), but no significant difference in comprehension between upper case throughout and just for keywords ( $p = .062$ ).

The inclusion of a supporting image per paragraph of text did not have a significant effect on reading comprehension ( $F(2,16) = 2.48, p = 0.135$ ). Interestingly, the highest mean number of correct responses was for text presented with a coloured photograph (4.0), however, there were no significant differences when this condition was compared to ClipArt ( $p = .101$ ) or text without a supporting image ( $p = .159$ ).

Comparisons across all conditions revealed that participants completed significantly more paragraphs correctly when reading text presented in the sans serif Verdana font, when compared to each of the serif font conditions, both letter case conditions and paragraphs supported with a single Clip-art image. There was no significant difference in the number of paragraphs completed correctly when text presented in Verdana was compared with paragraphs supported by a single coloured photograph ( $p = .345$ ). Reading comprehension was significantly better with the inclusion of a supporting image (either a photograph or ClipArt image) than when all of the text was presented in upper case ( $p = .000$  and  $p = .011$ ).

respectively). A supporting photograph also aided comprehension more significantly than presenting keywords in upper case ( $p = .021$ ) or in the serif Harrington font ( $p = .003$ ).

### **Conclusions and Implications**

Comprehension of written information was affected significantly by font style and letter case, though not by the addition of an image to support a paragraph. The hypothesis that people with aphasia would comprehend significantly more written information when it was presented in sans serif font was supported, consistent with the Stroke Association guidelines for producing aphasia-friendly written materials (Herbert et al., 2012) and aligned with research that reports people with aphasia cite a preference for sans serif text (Rose et al., 2012). Readability and paragraph length were matched across conditions and font size was controlled at 14pt, therefore it is likely that the significant difference in comprehension was due to the legibility of each particular font. It may be the case that like the general population (Sheedy et al., 2005), people with aphasia find it more difficult to identify letters with additional ‘feet’ (serifs) or calligraphic swirls.

Presenting written information in sentence case yielded significantly higher comprehensibility results when compared with text solely presented in upper case, supporting the original hypothesis. Duarte (2008) suggested that difficulty reading upper case letters may be linked to what is known as the ‘rule of distinction’; capital letters are more similar in style than lower case, therefore they are difficult to separate and more challenging to read. Although one study reported that a small number of people with aphasia felt capital letters were helpful for emphasising important information (Rose et al., 2011a), results from the present study reveal no measurable difference in comprehension when keywords were highlighted in upper case than when text was presented in sentence case. It is unusual for

passages of text to be written solely in capital letters, although warning signs (e.g. STOP) and important information are sometimes presented in this way. Further research is warranted to find out whether the effect of letter case is limited to passages of text or whether difficulties also arise within single word comprehension. This may have implications for the presentation of important information in order to make it more accessible.

The use of a single image to support comprehension of a written paragraph did not have a significant effect on the successful completion of paragraphs by people with aphasia in the present study, leading to the rejection of the hypothesis that type of pictorial support would aid comprehension. These results align with previous evidence, (Rose et al., 2011b), however they require careful consideration in light of the study limitations and further investigation. One possible explanation is that participant's ability to comprehend nouns was already at ceiling, therefore there may not have been scope for the images to have a significant impact on comprehension. Furthermore, it cannot be assumed that the outcomes would apply to comprehension of aphasia-friendly health information. Whilst using standard reading paragraphs permitted key variables such as readability and length to be controlled, further examination of the effect of images on comprehension is warranted, in particular, whether graphics should be used to represent keywords at a sentence level or paragraph level, and whether the inclusion of images to support more complex concepts aids comprehension. The study did not control for the quality of the images, and a more formal method for determining the keywords illustrated and capturing the imageability of each keyword would have allowed more robust conclusions to be drawn. The effect of graphics on comprehension is not the only consideration when designing written materials for people with aphasia. Several studies have reported client preference for graphics (Rose et al., 2012, Rose et al., 2011a) and images have also been reported to enhance the confidence of people with aphasia (Dietz et al., 2009). The

inclusion of supporting images can also make written information easier to remember and more engaging for members of the general public with low literacy levels (Doak et al., 1996). However, they can also be distracting and it can be challenging to find one image that encapsulates a concept (Brennan et al., 2005). The decision to include images should be based on the whole range of contextual factors, not just the measurable effect on reading comprehension.

The effect of images is likely to differ depending on the individual, and examination of individual participant performance did show that there was greater variability in comprehension within the graphics conditions. The relevance of the chosen image and the individual levels of knowledge and interest of each individual may have played a role here, however the randomisation of images to the conditions was used to control for these factors.

The current evidence for use of supporting images in assisting comprehension for people with aphasia is inconclusive. It may simply be the case that graphics aid comprehension for some people, whilst others do not benefit from extra visual support. There is such a degree of heterogeneity amongst those with aphasia that it is unlikely that the same adaptations will suit all clients. Investigations into the links between factors such as aphasia severity or acquired dyslexia type and the types of aphasia-friendly design features that are deemed to improve accessibility, may provide insight into making more individualised adaptations to written information.

The main limitation of this study was sample size, however three different conditions were independently tested, providing a useful insight into the individual effects of each of these variables on reading comprehension. Further studies would benefit from a larger sample size,

which would allow for a factorial ANOVA to be performed. The results should also be viewed in the context of limited information about participant's reading comprehension at paragraph level, therefore caution must be taken about generalising these results to a diverse population of people with aphasia. Calculating psycholinguistic variables for the stimuli paragraphs would have enabled further matching across the conditions to reduce potential effects of issues such as grammatical complexity or imageability. Future studies would also benefit from the inclusion of practice paragraphs. There is growing evidence, to which this study adds, that sans serif fonts are more comprehensible than serif font styles, however further research into the wide range of commonly-used sans serif fonts would help to define exactly which are the most legible. This work could be extended with a larger sample size, but also by examining the effect of combined variables to investigate whether or not there is an optimum combination of design features that create the most aphasia-friendly information.

This study adds evidence to the body of literature relating to aphasia-friendly text formatting. Further support is added to the current guidance (Herbert et al., 2012) that recommends using sans serif fonts and sentence case, however the study also found that supporting a paragraph of text with a single image may not be sufficient to effect the comprehension of all people with aphasia when text has a low readability level. Further research is needed to determine if the inclusion of multiple images aids comprehension for people with aphasia, and this needs to be tested at the range of reading levels commonly used in written health information and with participants with aphasia who present with a range of reading abilities. The identification of design features that aid comprehension is clearly important, however it is also critical to understand more about the links between comprehension and accessibility of information. People with aphasia are likely to be accessing a range of health services post-stroke, and it is critical to understand the effects of increased text comprehension in terms of

making information more accessible. Further research is required to investigate whether creating more comprehensible written information correlates with increased knowledge, autonomy, engagement with health services and wider participation.

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## Appendix

Stimuli paragraphs and word choices.

1. When water freezes into ice, it expands in volume. Thus, if a glass jar is full of water that freezes, the container is likely to
  - A. break.
  - B. keep the water from freezing.
  - C. freeze also.
  - D. stretch out of shape.
  
2. Many people are afraid of thunder. Thunder is not dangerous, but the lightning that accompanies it is. The thunder always reaches us later than the lightning; if we hear the thunder, we do not need to be afraid because the lightning has already
  - A. flashed.
  - B. exploded.
  - C. struck us.
  - D. roared.



3. The largest island in the world is Greenland, which belongs to Denmark. It lies so far north that about ninety per cent of it is covered by an icecap. Even in the southern part, winter lasts about nine months. Fish, copper, and iron are exported but not in large enough quantities to be very profitable. It is not surprising that the island is

- A. useful as an air base.
- B. sparsely populated.
- C. warm in summer.
- D. a Danish colony.

4. At the court of King Arthur there were many valiant knights, but chief among them was Sir Lancelot of the Lake; for in all tournaments and jousts and deeds of arms, he was

- A. the oldest.
- B. defeated.
- C. attractive.
- D. victorious.

5. After fruit has reached its peak ripeness, it spoils rapidly. Some fruit growers try to pick their fruit when it is ripe and then get it to market as rapidly as possible. Growers who depend on slower forms of transport may pick and ship their fruit while it is

- A. nearly rotten.
- B. at its peak.
- C. on the tree.
- D. still green.

6. Many countries have picnic parking places along their busy roads. These parks provide tables and benches under trees or in shaded places. Some of the picnic tables and benches are set in wooden shelters so that travellers can find a place to eat even

- A. late in the afternoon.
- B. when it is raining.
- C. when they are in a hurry.
- D. on busy motorways.

7. Cabbage is a very wholesome vegetable. In warm climates it is grown practically all year round, and in cooler areas it is grown in the spring and summer. Cabbage is

- A. hard to cook.
- B. always available.
- C. not very popular.
- D. expensive.

8. Knitted goods adjust to the shape of the wearer. Woven goods do not have this characteristic. It is because of this property that knitted materials are often used for

- A. clothing.
- B. towels.
- C. blankets.
- D. tablecloths.

9. Many people all over the world make their living by fishing. To a large number of people, however, fishing is a sport. Thus, catching fish may be either

- A. safe or dangerous.
- B. for profit or for fun.

- C. new or old.
- D. smart or foolish.

10. There are plants in the sea that look like animals, and animals that look like plants. Anyone who sees them knows that they are living things, but only an expert can tell

- A. how large they are.
- B. what shape they are.
- C. the plants from the animals.
- D. which are the living ones.

11. The transparent protective covering over the eyeball is called the cornea. The cornea must be kept wet. The closing of the eyelids every few seconds brings down tears from the tear glands. This keeps the cornea from getting

- A. dark.
- B. wet.
- C. scratched.
- D. dry.

12. Mr Smith was an extremely successful businessman. By the time he was forty years old, he was able to leave his business and

- A. enjoy a life of ease.
- B. become a pauper.
- C. earn a living.
- D. become wealthy.

13. Happy workers are better producers. People who leave home in the morning slamming doors behind them are apt to be less productive than the workers who leave home with a

- A. newspaper.
- B. dash.
- C. smile.
- D. frown.

14. Most furniture used to be handmade. Now that much furniture is made by machine, the manufacturing cost has been reduced; this furniture is less

- A. beautiful.
- B. useful.
- C. plentiful.
- D. expensive.

15. Bullfighting is a popular sport in Spain, and every large city in Spain has a bull ring. The person who fights and kills the bull is called a matador. Many people do not like to watch bullfighting because they think this sport is too

- A. tame.
- B. violent.
- C. competitive.
- D. expensive.

16. Christmas trees used to be decorated with candles. Now, electric lights are used in place of candles because there is more risk of fire with

- A. candles.

- B. plastic trees.
- C. live trees.
- D. electric trees.

17. White clothing is the most comfortable kind to wear in summer because white reflects the sunlight. Black clothing is the most uncomfortable in summer because black absorbs light.

When light is absorbed, it changes to

- A. fading.
- B. itching.
- C. irritation.
- D. heat.

18. One of the players on the football team has a broken collarbone and will not be able to play again this year. The coach must find a new player for that

- A. position.
- B. injury.
- C. suit.
- D. signal.

19. While her best friend watched, Gina rehearsed her magic tricks for the show. When Gina made a rose disappear, her friend said, "Fine, I didn't see anything wrong with that trick."

Gina was happy, for she knew that if she could fool her friend, Gina could easily

- A. fool the audience.
- B. continue rehearsing.
- C. detect mistakes.
- D. make a rabbit disappear.

20. Because Switzerland is such a small and mountainous country, all its fertile land has to be planted to produce enough food for its population. Houses there are built several floors high to hold more families. In this way, more land is made available for

- A. industry.
- B. building.
- C. parks.
- D. crops.

21. At the beginning of the nineteenth century, news travelled slowly. There was neither telephone nor telegraph, and there were few roads. Mail often had to be sent by

- A. messenger.
- B. wireless.
- C. plane.
- D. cable.

22. Rainbows appear during or just after a shower while raindrops are still in the air. The sun shines through these raindrops, which break up the sunlight into the different hues we see in the rainbow. The rainbow disappears when

- A. the sun shines the brightest.
- B. the air no longer contains raindrops.
- C. you look for it.
- D. you stand in the shade.

23. Some people just cannot throw anything away. They never feel sure that they will not need it again, and they are never

- A. saving.
- B. wasteful.
- C. useful.
- D. careful.

24. Window cleaners working without a scaffold on tall buildings wear strong straps around their waists. When attached securely to the window frame, these straps keep the window cleaner from

- A. moving.
- B. sitting.
- C. falling.
- D. seeing.

25. Though birds generally migrate at the end of summer and in spring, at almost any time of the year some birds may be found on the move. Birds are great

- A. eaters.
- B. travellers.
- C. hunters.
- D. friends.

26. The early explorers of the North Pole travelled by foot and by dog sledge through the ice and snow. The journeys were very dangerous and took many months. After the invention of the plane, trips to the North Pole, although still fairly dangerous, could be made in

- A. an icebreaker.
- B. a few hours.
- C. the summer.
- D. a few sledges.

27. Elephants do not fear most other animals in the jungle. Elephants are so huge that other animals just leave them alone. The other animals also know that elephants are peaceful.

Elephants can go on their way

- A. without trouble.
- B. if lions decide to let them pass.
- C. wherever they find friends.
- D. only the cover of darkness.

28. We need to protect our growing plants and gardens from animals that harm them. Some worms and insects destroy plants, whereas other insects are helpful because they eat the

- A. fruit.
- B. poisons.
- C. trees.
- D. harmful insects.

29. The journey included many hardships for the travellers. The trail was often rough; frequently, the weather was unpleasant; often, water was

- A. cool.
- B. scarce.
- C. found.

D. plentiful.

30. Since there is no delivery on Sunday, the Monday post is very heavy. Post vans have more stops to make on Monday, so they usually come

- A. nearer.
- B. more often.
- C. faster.
- D. later.

31. The cheetah is found in Africa and Asia. Since the cheetah can run as fast as 110 kilometres an hour, it can easily overtake its prey. Natives sometimes tame the cheetah and use it for

- A. farmwork.
- B. food.
- C. bait.
- D. hunting.

32. People who live and work in large crowded cities do not get as much sunshine as those who live in the country. Most city workers spend most of their time at work that is

- A. done indoors.
- B. unimportant.
- C. very strenuous.
- D. pleasant.

33. Mammals are warm-blooded animals. That means that their bodies stay the same temperature at all times. If the weather gets very hot or very cold, a mammal's body temperature

- A. always gets warmer.
- B. may get colder.
- C. will change too.
- D. does not change.

34. Obviously, the book had been very well liked. It was in a battered condition as a result of its having had numerous

- A. pages.
- B. authors.
- C. readers.
- D. printings.

35. Because of its hardness, oak resists wear and burns. This hardness makes oak particularly suitable for fence posts, building materials and furniture. The wood from an oak tree has many

- A. leaves.
- B. branches.
- C. acorns.
- D. uses.