**Activity: Logical order**

**Passage 5.28: Circadian rhythms**

1: In experiments, human volunteers spent several weeks underground in constant light.

2: At first, their natural clock and sleep patterns were disrupted.

 3: After a few weeks, they reverted back to the natural circadian rhythm with a 24-hour clock more or less in line with the outside world.

4: Our natural clocks are helped to adjust by exposure to sunlight and do respond to patterns of light and dark.

5: Our bodies remain more responsive to biological rhythms than to the demands of clock time or the distractions of the outside world.

6: Since the mapping of human genes as part of the genome project, we have a greater understanding of circadian rhythms and their role in genetic conditions.

7: Some families have genetic conditions which make them less sensitive to circadian rhythms.

 8: This may help explain patterns of sleep disturbances found in those families.

9: Our work patterns, leisure patterns, architecture, lighting, food, drugs and medication compete with our natural clocks.

10: These biological rhythms are known as circadian rhythms and we know they are particularly strong in birds.

11: In humans they are particularly controlled by the suprachiasmatic nucleus (SCN) in the anterior hypothalamus at the base of our brains.

 12: If this part of the brain is damaged, a person loses all sense of a natural 24-hour clock, where sleep coincides with night-time.

13: In other people, circadian rhythms are much stronger than was expected.

 14: Astronauts, who lose this connection to the sun’s rhythms for a long time, find it hard to adjust.

 15: Many require medication to help them sleep.

16: Night-workers, even after 20 years on shift patterns, do not adjust circadian rhythms to suit the demands of night working.

17: Certain illnesses such as peptic ulcers and heart disease, as well as increased risk of car crashes, are much more common to night-shift workers.

18: As the long-term effects of disrupting circadian rhythms are yet to be discovered, we should take care to ensure the health of shift-workers and those with genetic conditions that make them less sensitive to the biological 24-hour clock.

19: It may be that conditions associated with mental ill-health, such as schizophrenia and bi-polar disorders, are also linked to malfunctions in circadian rhythms.