1. **Read the article and choose from the list A-K the best phrase to fill each of the spaces 1-11.**

SNOWFLAKES

Adapted from http://en.wikipedia.org/wiki/Snowflake

Snowflakes are conglomerations of frozen ice crystals which fall through the Earth's atmosphere. They begin as two snow crystals which develop **1.** ..... . Snowflakes come in a variety of sizes and shapes. Complex shapes emerge as the flake moves through differing temperature and humidity regimes. Individual snowflakes are nearly unique in structure. Types which fall in the form of a ball due to melting and refreezing, rather than a flake, are known **2.** ..... .

Snow crystals form when **3.** ..... **.** These droplets are able to remain liquid at temperatures lower than −18 °C (0 °F), because to freeze, a few molecules in the droplet need to get together by chance to form an arrangement similar to that in an ice lattice; then the droplet freezes around this "nucleus." Experiments show that this "homogeneous" nucleation of cloud droplets **4.** ..... . In warmer clouds an aerosol particle or "ice nucleus" must be present in (or in contact with) the droplet to act as a nucleus. The particles that make ice nuclei are very rare compared to nuclei upon which liquid cloud droplets form, however it is not understood what makes them efficient. Clays, desert dust and biological particles may be effective, although to what extent is unclear. Artificial nuclei include **5.** ....., and these are used to stimulate precipitation in **cloud seeding**.

Once a droplet has frozen, it grows in the supersaturated environment, **6.** ..... when the temperature is below the freezing point. The droplet then grows by **deposition** of water molecules in the air (vapor) onto the ice crystal surface where they are collected. Because water droplets are so much more numerous than the ice crystals due to their sheer abundance, the crystals are able **7.** ..... at the expense of the water droplets. This process is known as the Wegner-Bergeron-Findeison process. The corresponding depletion of water vapor causes the droplets to evaporate, meaning that the ice crystals grow at the droplets' expense. These large crystals are an efficient source of precipitation, since they fall through the atmosphere due to their mass, and **8.** ..... . These aggregates are snowflakes, and are

usually the type of ice particle that falls to the ground. Guinness World Records list the world's largest snowflakes as those of January 1887 at Fort Keogh, Montana; **9.** .....

The exact details of the sticking mechanism remain controversial. Possibilities include mechanical interlocking, **sintering**, electrostatic attraction as well **10.** ..... . The individual ice crystals often have hexagonal symmetry. Although the ice is clear, scattering of light by the crystal facets and hollows/imperfections mean that the crystals often appear white in color due to **11.** ..... by the small ice particles.

A. to grow to hundreds of micrometers or millimeters in size
B. may collide and stick together in clusters, or aggregates
C. **diffuse reflection** of the whole spectrum of light
D. as graupel, with **ice pellets** and snow grains as examples of graupel
E. when microscopic **supercooled** cloud droplets freeze
F. tiny supercooled cloud droplets (about 10 μm in diameter) freeze
G. only occurs at temperatures lower than −35 °C (−31 °F)
H. which is one where air is saturated with respect to ice
I. allegedly one measured 38 cm (15 inches) wide
J. particles of **silver iodide** and **dry ice**
K. as the existence of a "sticky" liquid-like layer on the crystal surface

2. Complete the definitions below with the words in bold from the article.

1. ..... is the solid form of carbon dioxide, comprising two oxygen atoms bonded to a single carbon atom. It is colourless, odourless, non-flammable, and slightly acidic.

2. ..... is a yellow, inorganic, photosensitive compound used in photography, in medicine as an antiseptic, and in rainmaking.

3. ..... is the process of lowering the temperature of a liquid or a gas below its freezing point without its becoming a solid.

4. ..... is a process in which gas transforms into solid (also known as desublimation). The reverse of ..... is sublimation.

5. ..... (also referred to as *sleet* by the United States National Weather Service) are a form of precipitation consisting of small, translucent balls of ice. Ice pellets usually are smaller than hailstones. They often bounce when they hit the ground, and generally do not freeze into a solid mass unless mixed with freezing rain.

6. ..... is the reflection of light from a surface such that an incident ray is reflected at many angles rather than at just one angle as in the case of specular reflection.

7. ..... is a method for making objects from powder, by heating the material below its melting point until its particles adhere to each other. It is traditionally used for manufacturing ceramic objects, and has also found uses in such fields as powder metallurgy.

8. ..... , a form of weather modification, is the attempt to change the amount or type of precipitation that falls from clouds, by dispersing substances into the air that serve as cloud condensation or ice nuclei, which alter the microphysical processes within the cloud.