

Tektites

What are tektites?

Tektites are natural glass objects formed by large meteorite or comet impacts with the Earth. During these impacts, terrestrial rock (from the surface of the Earth) is melted and ejected into the upper atmosphere. As the molten rock rains back down to the surface of the Earth, it solidifies into objects called tektites.

How do they form?

- A large meteorite or comet hits the Earth, usually at a steep angle.
- Terrestrial (Earth) rock is melted and ejected into the upper atmosphere at extreme speeds.
- The molten rock rains back to the ground
 - If they land close to the impact, they land molten or with just a thin outer shell which may crack on impact.
 - At medium distances of around 2,000 to 4,000 km from the impact they have solidified sufficiently on the outside that during re-entry into the atmosphere, they heat up causing paper thin cracks on the surface.
 - At greater distances of around 4,000 to 6,000 km, the tektites have solidified before re-entering the atmosphere. The heat of re-entry melts the exterior which gives them fascinating features on the surface.

Where are they found?

Tektites are found in geographically restricted areas or 'strewn fields' around a source crater. The most recent and largest strewn field is in Australasia with tektites being found in the Indochinese peninsula (Thailand, Vietnam, Cambodia, Laos and southern parts of China), the Philippines, Malaysia, Indonesia and Australia. These tektites are derived from an unknown crater in the Indochinese peninsula area.

The second largest strewn field is in North America with tektites being found in Georgia and Texas, derived from the Chesapeake Crater.

The green moldavite tektites are found principally in the Czech Republic from the Ries Crater in Germany.

Are tektites a kind of meteorite?

No, tektites are formed by large meteorites or comets impacting the Earth and they are made from terrestrial (Earth) rock. Meteorites come from space, tektites come from the Earth as a result of an impact with a meteorite or comet.

Which side is the front and which is the back?

This often causes confusion! The front side of the tektite, also known as the anterior, faced the direction of flight. The front side usually shows modifications. The rear side, or posterior, is usually smooth and preserves the original 'spherical' shape of the body. So, the anterior surface is modified:



ABOVE: Hardest to differentiate until you get your eye in - The Indochinites. This teardrop specimen is from China. Photo 1 has the anterior surface at the base (note the bald spot). Photo 2 is the smooth unaltered posterior. Photo 3 is the anterior, showing many etch pits and a bald spot around the rim where glass has flaked away, due to thermal shock during re-entry. Note the similarities with australites, where the margins of the anterior flake away. Also, in these teardrop specimens the shape is a give-away - the 'tail' points up on the posterior.



ABOVE: Philippinites. On the left a side view, with the grooved anterior surface facing down. The grooves are chemically enhanced thermal cracks. In the middle is the smooth unaltered posterior. To the right is the grooved anterior. Billitonites and Malaysianites basically have the same morphology as Philippinites, as do bediasites.



ABOVE: Easiest of the lot. An Australite core in side profile and a button australite in side profile. In both cases the anterior surface is the bottom of the photo. The core has lost its shell due to thermal shock during re-entry, whereas the button has simply ablated. Buttons are never found over around 6 grams, as over that size they are thermodynamically unstable and will always 'flake' to form a core during re-entry heating. Look at the posterior surface of the button - this shows the original spherical shape of the body prior to re-entry.

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Group Activity

Get the group up on their feet and define a line in the middle of the room. One side of the line represents True and the other False. Read out the list of statements below (any order) and ask everyone to go to the side they think is correct.

- (Start here) Tektites are large space rocks that have hit the Earth. (FALSE)
- Tektites are made of natural glass formed from melted rock (TRUE)
- Meteorite strewn fields don't exceed 1000 km² (FALSE)
- Tektites crack on impact if they land more than 6000km from the impact point (FALSE)
- Tektites are thrown high into the atmosphere by an impact. (TRUE)
- Tektites are mostly shaped by heat and friction (TRUE)
- The largest known strewn field is in South America (FALSE)
- Paper thin cracks form when the tektite lands between 2000-4000km away (TRUE)
- Tektites can land on the other side of the planet to the impact that created them (TRUE)
- Fascinating features like pots and bumps form when the Tektites land in water (FALSE)
- The front side of a tektite is more spherical than the back (FALSE)