

# ALIGNMENT OF PHENOCRYSTS

## *Purpose*

*This experiment is designed to show you what causes phenocrysts to become aligned. The syrup represents the magma and the sugar strands the phenocrysts.*

## *Instructions*

### *Activity 1*

- 1 Place the board on the wooden strip to give it a slope. Set up the channel with the wooden gate at A, about 5cm from the end.*
- 2 Pour about 600ml of golden syrup (about one large tin) into the area behind the gate.*
- 3 Sprinkle sugar strands onto the surface of the syrup.*
- 4 Pull the gate away and carefully watch what happens to individual strands.*
- 5 Once the syrup is running down the trough look to see if there is any preferred orientation of the strands. If possible take a vertical photograph of the syrup.*

### *Activity 2*

- 1 Set up the channel and place the card against the channel entrance.*
- 2 Pour one tin full of golden syrup into the magma chamber.*
- 3 Sprinkle sugar strands on the syrup.*
- 4 Remove the card and watch carefully the movement of individual strands as they enter the channel, as they move along the channel and as they leave it.*
- 5 Note if there is any pattern to the orientation of the strands both in the channel and at the end. Take a photograph if possible looking straight down.*

*You should now have enough information to say what causes the phenocrysts to become aligned and whether they will be parallel to or at right angles to the direction of magma movement*

#### **Question**

*Would you expect the alignment of phenocrysts to be parallel to or at right angles to the direction movement at the front of a lava flow?*

### **Teacher's Section**

#### **Requirements**

*Two 2lb tins of golden syrup to represent magma*

*One container of sugar strands to represent the phenocrysts*

*One channel and magma chamber made from wood ex 6cm (=5.5cm thick) as shown in the diagram glued to plywood 34cm by 55cm. This will take about 1 hour to make.*

*Support strip of wood 40cm by 5cm by 5cm*

*Gate block of wood 6cm by 4cm by 4cm*

*Piece of card 10cm by 7cm.*

*Camera*

#### **Notes**

*It is useful to take photographs of the patterns.*

*Beware things tend to get sticky. The syrup can be stored and reused.*

*The sugar strands float to the top and are best skimmed off and thrown away. This experiment is best done as a demonstration. Students can then plot rose diagrams from photocopies of the photographs.*

#### **Alternative methods**

*Peter York describes a method using wallpaper paste, pieces of plastic and funnels to illustrate alignment of phenocrysts. Teaching Earth Sciences 20 (4) 149.*

#### **Results**

*Students should find that the sugar strands are aligned parallel to the direction of flow as they move into the channel from the magma chamber. Once they are in the channel they move along without altering their orientation except near the edges (remember how pooh sticks float down a*

stream). As they leave the channel their orientation is again changed so that it is at right angles to the direction of flow.

Time  
30 minutes



