

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- falls down
- Builds up
- particles look as they are hopping and rolling down
- 2 meters of sand
- base gets wider.

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°

3. Describe the size of the pile as it builds – how does the pile increase in size?

The pile grows up and becomes wider as more sand is poured onto it.

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

It does change shape it grows taller & wider as more sand is added to it.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- As more sand is added ✓ it will grow wider
- It will become taller. ✓
- Will not get any taller than 3.5 meters due to tube. (unless tube is raised up more)

Watch the second snip.


1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- Sand became less hopping

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• sand is pilling in a  shape
• base grows wider as more sand pours



2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°

3. Describe the size of the pile as it builds – how does the pile increase in size?

Base grows wider,

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

Shape goes from curved

 to less curved 

Becomes more point, triangle like and less curvy & round like

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Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- pile's base will grow wider ✓
- will be ~~less~~ ^{more} cone shaped ✓
- ^{slope} Angle will change (increase)
- sand increasing less interest

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2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- Continues to gradually increase and get taller
- Some of the sand doesn't stay in the pile and falls off.

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 90
3. Describe the size of the pile as it builds – how does the pile increase in size?

yes it does, gets larger

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

Shape becomes more sharp starts off as a small little pile then gradually stretches out.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- ✓ I still think the pile will continue to grow
- ✓ grows wider ~~not taller~~
- will probably not get taller due to weight of sand & space on the top.

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- The pile does grow taller AND wider
- The pile fluctuates from taller to shorter then back taller again it changes.

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1. Notes to myself as the pile builds (e.g., interesting observations).

- Bounce
- Rolling
- higher it goes wider bottom
- Same position causes repetition

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built ~~72°~~ 80°
3. Describe the size of the pile as it builds – how does the pile increase in size?

The bottom gets larger as the height increases.

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

It only grows the shape its in a pyramid shape without structured angles and lines.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- It will double in size ✓
- Might not have room to grow due to height ✓
- width gets bigger as it gets taller
- Might all fall down –
- More sand will be on it. ✓

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- Oversaturated
- erosion happening fast.
- their rate its being poured out is too much too fast for growth to happen beyond that point –

Purpose(s) of video(s): observing, describing, predicting
Training Discussion: <http://ezsnips.com/hnlohUAaHmnO>
Assessment video(s): <http://ezsnips.com/Bxro4J4Cb5f9p>

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).
 - jumps around, slides down
 - grows in height
 - sand around pile, not all sand was included

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 120°

3. Describe the size of the pile as it builds – how does the pile increase in size?
 - taller, wider as it builds
 - smaller at top.
 - almost 2 1/2 cm or 1 inch tall

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.
 - pyramid shaped
 - yes changes shape

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- more dispersed on sides, will grow wider and a little taller in height. ✓
- might change the shape of the pile originally

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
 - 2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.
-

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- Starts flat
- slowly rises up

Consistent

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°
3. Describe the size of the pile as it builds – how does the pile increase in size?

The pile increases steadily though I feel like a saw it stop growing upwards occasionally

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

The shape stays the same but it grows in width and height

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- should continue to grow upwards and outwards. ✓
- ~~It~~ may stop growing "at a certain height and collapse." ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- Stopped growing and started collapsing. Still grows outward.

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- builds up on sides then center
- grains bounce on sides

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°
3. Describe the size of the pile as it builds – how does the pile increase in size?

grains build up sides

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

hill-like shape with center being highest point
started off flat

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- the grains will give a more bulky look to sides

slightly growing a little taller

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- sand grew taller but slid back down constantly

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• built up and out until terminal height then it just built out in an orderly fashion

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°

3. Describe the size of the pile as it builds – how does the pile increase in size?

up and out then eventually it builds primarily outward

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

Conical no it doesn't change because no other force is acting on it to change it

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- mostly the same height (a little taller) ✓
- it will increase in diameter which will decrease its angle ✓
- I + will start by damaging the pile (slightly) then rebuilding the damaged spot ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- it doesn't keep the perfect shape at the end as before

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Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- mostly centered
- grows in size
- same shape

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 70°

3. Describe the size of the pile as it builds – how does the pile increase in size?

It gets taller, but the width pretty much remains the same

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

It does not change shape, it just gets taller.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- the size will be larger
- it will appear to be bigger, maybe even smaller
- the angle will remain the same
- still centered ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- the size remained the same, it does not increase in height
- the width is mostly the same

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- Straight Cone Like
- Volcano Shape
- Sand Falling makes Bottom Thicker
 - Particles Falling to Bottom
- 5 cm (Exposed)
- 2 1/2 (Approx) When Stopped

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°

3. Describe the size of the pile as it builds – how does the pile increase in size? Large Point
Volcano Shape. Bottom becomes larger with Falling Particles

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

Stays Consistent, Just Increases In Size.
Cone Shape from beginning to End.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- Continue the Cone Shape, but become larger
- Steepness of Cone will increase
- Fatness of Bottom will thicken also increase with falling sand particles
- Too Approx 4 cm
- Could Collapse Eventually

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- Bottom is Thicker
- more Sand Falling to Bottom
- Stayed About the Same
- Roughly Same Height

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- Sand humps in middle, then slowly spreads out.
- Most sand flows to bottom

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 30°
3. Describe the size of the pile as it builds – how does the pile increase in size?

Pile gets bigger at base first. Once base is larger, more sand is trapped at top.

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

Shape started out not as mounded up, but filled out as more sand was poured.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- Base will once again build before top gets bigger/taller. ✓
- Shape will grow in much the same way – base will be bigger than top. Base will spread out more. ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- Tip gets slightly eroded, then built back up, then eroded again.... etc.
- Erosion of tip creates larger base.

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1. Notes to myself as the pile builds (e.g., interesting observations).

- The sand spreads out faster than it climbs upward

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 120° from horizontal.
3. Describe the size of the pile as it builds – how does the pile increase in size?

It first spreads out, then grows upwards.

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

It seems to become steeper in slope as it builds. It almost resembles a volcano.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- It will continue to widen faster than it grows vertically. ✓

- It may begin to look like a shield volcano.

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- It became steeper.

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- Sand hits table + spreads out.
- As sand accumulates, the mound becomes taller and wider.
- Sand rolls down side of building mound
- builds to 2cm in height

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°
3. Describe the size of the pile as it builds – how does the pile increase in size?

The pile increases in width as sand falls on the table, and then accumulates height and more width.

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

The pile increases from a flat layer of sand to a triangular, dome shaped mound of sand.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- The pile will look the same, but it will become larger in size. ✓

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- The sand gets to a certain height + collapses
- The pile grows in width + height to 2.5cm

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- grows fast
- hits a plateau
- low viscosity
- sprinkles outward

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 90°

3. Describe the size of the pile as it builds – how does the pile increase in size?

it grows larger, but eventually stops growing

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

the pile remains about the same shape, like two corners of a triangle (pyramid)

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- the second volume will make the first pile spread out more
- it will not increase in size
- the top may change shape (caldera?)

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- fluctuates in size after an initial increase
- the sand eventually becomes too heavy for the pile.

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• It goes slow when the height of the pile near 2 cm

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 90°
3. Describe the size of the pile as it builds – how does the pile increase in size?

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

Yes, the angle goes smaller.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

• The height might be lower

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

• the top of the pile keep collapsing.

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Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- slow build up
- gets taller & wider as more sand is poured
- bottom of pile is larger
- sand falls around bottom from top.

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 120°

3. Describe the size of the pile as it builds – how does the pile increase in size?

as it gets taller, it widens out.

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

no, just gets wider

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- sand will fall on top & it will flatten out.
- Then build up on top
- wider @ the bottom
- Top cone part will be wider.

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.

- 2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- doesn't go flat
- keeps piling on top.
- top wider & body

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• growth upward more than
out until 1.5 cm, then
more out, then slightly
up, again, but overall
out

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°
3. Describe the size of the pile as it builds – how does the pile increase in size?

goes up until 1.5 cm, then
more outward

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

changes from more
vertical tube-like to
a funnel, round,
more symmetrical
shape.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- ✓ outward growth at first,
- ✓ then some grain will fall from the sides.
- ✓ Then, it will continue to gain circumference

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- Gained a little more in height than I had anticipated

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Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- Builds in a cone/mountain shape
- Builds fast
- Sand goes down as it comes out the tube
- Gets wider as more is poured
- 2 cm

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 160°

3. Describe the size of the pile as it builds – how does the pile increase in size?

- Goes from small to large
- Narrow to wide

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

- Goes from small hill to mountain shape.
- Yes it gets taller & wider as more sand is added.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- It'll start to decrease in height

- Flatten out

- The degrees will increase

- The cm will decrease

- Get wider ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- Get taller

- Increase in cm by 0.5

- New sand fell quicker to the bottom

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- It slowly gets taller but the sand is also falling on all sides of the pile making it also wider

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°

3. Describe the size of the pile as it builds – how does the pile increase in size?

It gets taller but also wider b/c the sand slides down the sides of the pile

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

It doesn't really change shapes. It just gets taller / bigger, but it's the same shape.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- I don't think it will change shape
- It'll get taller & definitely wider
- I think it will do the exact same that the first one did except on top of another pile of sand

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- It's not getting any taller only wider
- all the sand is sliding down the sides of the first pile

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Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- It never piles up over 2 in
- Shape stays the same

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built _____

3. Describe the size of the pile as it builds – how does the pile increase in size? The pile expands at the bottom. Never rises over 2 in.

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

Does not change shape just gets bigger.

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- ✓ It will rise above 2 in
- ✓ The size of the pile will increase
- ✓ The shape of the pile will change

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- My predictions were all correct about the pile

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• as it get taller & builds its width ~~also~~ also grows
 • many of the grains of sand ricochet off and making ~~it~~ pile up ~~while~~ while piling wide

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°
 3. Describe the size of the pile as it builds – how does the pile increase in size?

As it increases in height, it increases in width as well

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

This particular pile doesn't change shape – it simply continues to grow

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

• sides continue to get wider, ~~as height~~ as height ~~also~~

~~some of the~~

pile continues to grow but stops growing in height altogether
 Watch the second snip.
 1) Put a check beside any prediction (above) you got substantially correct.
 2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

• Reached a peak to where only sand flew down the sides and the mound ~~didn't~~ grow

– sand also stopped falling as far down the sides – instead became distributed evenly

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• The sand has to build out before it builds up.
sand bounces out to form a base and rises in height relative to the size of base.

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 45°

3. Describe the size of the pile as it builds – how does the pile increase in size?

increases horizontally and vertically at a similar rate.

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

angle of pile stays the same. Base + height grow.



Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- base gets wider at a greater rate than height. ✓
- decreases in height before growing.
- sand from top pushed out + down at beginning. ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- pile rises and falls in height as sand collapses downward from sides like a landslide.

Part I: Prof. Brande set up some laboratory equipment to drop a volume (about 50 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address questions below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- height builds quickly at first
- base becomes wider as the height increases
- very wide at the bottom

2. Estimate the angle (in degrees) of slope of a side of the pile after it is built 60°
3. Describe the size of the pile as it builds – how does the pile increase in size?

The pile builds quickly at first, then it slowly builds out a large base and gains height

4. Describe the shape of the pile as it builds – does the pile change shape, or not? Describe.

The pile goes from flat to having height but not a big base then to having a very large base

- The top of the pile is rounded

Part II: Describe, identify, predict – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- the size of the pile will get larger ✓
- the base will get larger + the pile will gain height ✓
- the pile will still have a rounded top ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your prediction, or that you noticed while watching but didn't anticipate.

- the top of the pile builds up a little height + then the sand slides down to the base

ES101-4A

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
 - some particles splutter outward
 - some particles continuously fall down side of mound
 - build slowly
 - larger particles fall to base of mound
- Estimate the maximum height of the pile after it is built 2 cm
(numbers on the scale in centimeters)
- Estimate the angle (in degrees) of the side slope after pile is built 80°
- Describe the size of the pile as it builds – how does the pile increase in size?
it widens
2 inches wide
- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

shape remains in form of a pyramid

Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 2 1/2 - 3 cm
- other predictions:
same as before

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- *ht. prediction on target ✓*
- *same observation as before ✓*
- *mound widens*
- *larger particles continue to fall to base of mound ✓*
- *lighter particles stay toward top*

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• angle stays constant, height builds as base diameter grows

2. Estimate the maximum height of the pile after it is built 2.0 cm
(numbers on the scale in centimeters)

3. Estimate the angle (in degrees) of the side slope after pile is built 45°

4. Describe the size of the pile as it builds – how does the pile increase in size?

Increases in height as base grows wider due to base being able to support more sand

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.



Shape remains constant

Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 3 cm
• other predictions:

✓ height growth rate / time slows due to increasing circumference of base, taking more sand per unit of time to add a cm of height

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

• growth increased at a slower rate than I anticipated

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
 - After about 1 ~~cm~~ the growing, slowed down drastically.
 - Fell almost perfectly even all around.
 - Top is small
- Estimate the maximum height of the pile after it is built 2
(numbers on the scale in centimeters)
- Estimate the angle (in degrees) of the side slope after pile is built 30
- Describe the size of the pile as it builds – how does the pile increase in size?
Height first then width.
- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.
Started skinny then quickly widened.



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 3 14
- other predictions:

✓ angle will increase

✓ will be wider than it is tall

✓ won't grow as fast

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- Parts of the upper area broke and slid to the bottom
- Height did not reach above 2.5
- fell uneven

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
 - piles on slowly. Much disperses around the sides.
- Estimate the maximum height of the pile after it is built 2 1/8 cm
(numbers on the scale in centimeters)
- Estimate the angle (in degrees) of the side slope after pile is built 45°
- Describe the size of the pile as it builds – how does the pile increase in size?

Base increases. Every part of the pile must increase to raise the height.

- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

• similar shape throughout.



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 2.6 cm ✓
- other predictions:
 - Pile will rise much more slowly than the first pile. ✓
 - angles of sides will slightly decrease. ✓

Watch the second snip.

- Put a check beside any prediction (above) you got substantially correct.
- Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

• the top really flattened off with the stopping of the sand.

angle stayed the same.

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
 - builds on top of each other like a pyramid.
 - comes to a point when it stop ~~building~~ growing in upward, it starts accumulating in width.

- Estimate the maximum height of the pile after it is built 2cm
(numbers on the scale in centimeters)

- Estimate the angle (in degrees) of the side slope after pile is built 45°.

- Describe the size of the pile as it builds – how does the pile increase in size?

It increases in height first & then in width.

- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

Like a pyramid. No.
volcano.



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 2.5cm
- other predictions:

✓ It will just be wider at the bottom,
✓ It won't grow in height too much.

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- all that I thought was correct.
I didn't anticipate how the sand was trying to build on top but due to gravity it was kept being pushed down making the base bigger, as I had predicted.

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• As the pile builds the excess sand bounce off onto the floor and covers the floor.

2. Estimate the maximum height of the pile after it is built 2cm
(numbers on the scale in centimeters)
3. Estimate the angle (in degrees) of the side slope after pile is built 45
4. Describe the size of the pile as it builds – how does the pile increase in size?

yes, the pile does increase.

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

it builds almost as if it were an Ant Bed no, it does not change shape



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 4 cm
- ✓ other predictions:

The final ~~pile~~ pile will be bigger

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

• The sand basically maxed out at a certain level. I guess the pile got weak and the rest of the sand rubbed onto the floor. I expected it to get bigger.

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• Sand is piling up in a hill almost in a triangle shape
Sand sliding off slopes.

2. Estimate the maximum height of the pile after it is built 2 centimeters
(numbers on the scale in centimeters)
3. Estimate the angle (in degrees) of the side slope after pile is built 90°
4. Describe the size of the pile as it builds – how does the pile increase in size?

• pile builds ^{onto} itself as sand piles up. sand slides down sides in a cone shape as it settles on top.

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

pile does not change shape



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 2.5 centimeters
- other predictions:

• pile grows wider as more sand piles on.

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

• pressure of sand being dropped degraded surface at times.

NAME: Marymory Section: 401/4

Purpose(s) of video(s): observing, describing, predicting

Training Discussion: <http://ezsnips.com/hnlohUAaHmno>

Assessment video(s): <http://ezsnips.com/Bxro4J4Cb5f9p>

Part I: observe, describe, estimate, Prof. Brande
set up some laboratory equipment to drop a volume
(about 25 ml) of clean, dry sand onto a flat surface.
Watch as the pile builds, make notes, and address
issues below.

1. Notes to myself as the pile builds (e.g.,
interesting observations).

I notice + ~~something~~ taller.

2. Estimate the maximum height of the pile after it
is built 200 mm
(numbers on the scale in centimeters)

3. Estimate the angle (in degrees) of the side
slope after pile is built 90°

4. Describe the size of the pile as it builds - how
does the pile increase in size?

I ~~was~~ evenly ~~clumpy~~ over the
pile as it pours out

5. Describe the shape of the pile as it builds -
does the pile change shape, or not? Also,
sketch a cross-section of the final pile.

~~It changed shape~~
~~It just became a larger~~
It gets taller

Part II: prediction and assessment - a second
volume of sand will be dropped on the existing pile.
1st make some predictions (bullet list) about the
appearance (how will it be different, if at all?) and
the size of the pile after the second volume of sand
is poured onto its top.
• predicted height = 21.5 inches
• other predictions:

It will get taller.
maybe steeper.

I will run off

the existing pile stay
the same height.

Watch the second snip.
1) Put a check beside any prediction (above) you
got substantially correct.
2) Describe new appearances and motions that
differed from your predictions, or that you noticed
while watching but didn't anticipate.

I got steeper.

The angle looks

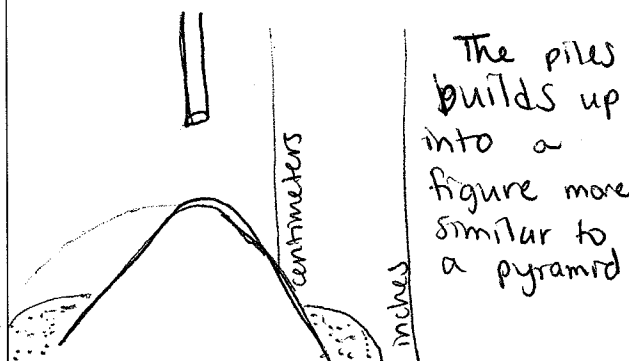
almost a bit less than
90° now.

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
 - As the pile builds, particles of sand move outwards
 - Once the sand drops it bounces
 - As it drops the edges become more defined.
- Estimate the maximum height of the pile after it is built about 2 centimeters (numbers on the scale in centimeters)
- Estimate the angle (in degrees) of the side slope after pile is built _____
- Describe the size of the pile as it builds – how does the pile increase in size?

The pile's width and diameter increases as it grows.

- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 3.5 cm
- other predictions:
 - The pile will not be 2x as high as the first pile ✓
 - Once the 2nd pile drops it will flatten or decrease the height of the first pile. ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- The sand tries to build up but its height decreases
- The sand's width and diameter continues to grow, but does not lead to an ~~more~~ increased height

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• goes up spreads out
as it gets higher
it goes slower

2. Estimate the maximum height of the pile after it is built 2 inch
(numbers on the scale in centimeters)

3. Estimate the angle (in degrees) of the side slope after pile is built 70°

4. Describe the size of the pile as it builds – how does the pile increase in size?

it gets bigger at base

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

round bottom round top



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 1 1/2
- other predictions:

might brake with second
Pile of sand
✓change shape

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

• The right got bigger
top fell at about 2 1/2 inches

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

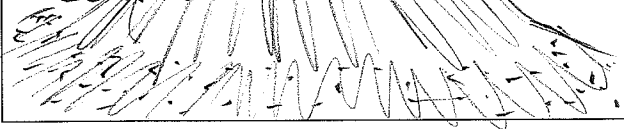
- Sand spreads before the pile starts to gain height
- Outer area around pile grows in small amounts
- as the pile gains height it also gains width/circumference

2. Estimate the maximum height of the pile after it is built 2 cm
(numbers on the scale in centimeters)
3. Estimate the angle (in degrees) of the side slope after pile is built 90°
4. Describe the size of the pile as it builds – how does the pile increase in size?

the pile increases in height and width. At first height seems to be gained quicker but as the height grows the width seems to grow quicker

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

A pyramid or triangle; there is a base around it where the grains of sand are unable to stay on top / in pile accumulate.



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 2.5 cm
- other predictions:

- ✓ base will grow
- the width will grow at a faster rate than the height.
- As the pile gets higher the viscosity (sp?) increases more sand will flow down to the base.

Watch the second snip.

- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- The weight of the new sand caused some of the sand to move down to the base.

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- Dome
- wide base

2. Estimate the maximum height of the pile after it is built 2 cm
(numbers on the scale in centimeters)

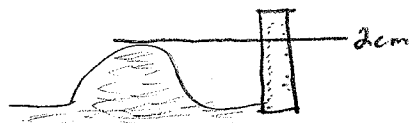
3. Estimate the angle (in degrees) of the side slope after pile is built 120°

4. Describe the size of the pile as it builds – how does the pile increase in size?

Grains move down towards the base and as the base grows larger it gives more room for sand to make it taller.

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

Dome, becomes more and more rounded on top.



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 3 cm.
- other predictions:
 - ✓ • Dome shape
 - ✓ • wider base
 - ✓ • 145° slope
 - ✓ • more flat than first pile. (spreads out)

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- 2.5 cm.
- Sand continuously falls to the base, thus keeping the height the same.

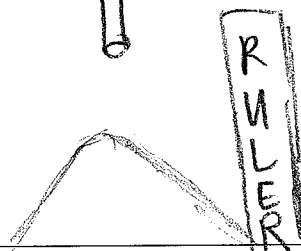
Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
 - sand falls quickly out of tube
 - reaching no higher than 2cm. Remainder grains on outside of hill.
 - sand starts to fall from "hill" making it not become higher than 2cm
- Estimate the maximum height of the pile after it is built 2cm
(numbers on the scale in centimeters)
- Estimate the angle (in degrees) of the side slope after pile is built 360°
- Describe the size of the pile as it builds – how does the pile increase in size?

Medium sized. It does increase, However the pressure from flow of sand makes it hard to "stick"

- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

Dome shaped. Pile does change shape. Becomes taller overtime



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 2.5cm ✓
- other predictions:
 - will slowly increase. ✓
 - pressure from new sand will cause dome to not build up. ✓
 - more grains of sand will end on after of dome, farther from dome. ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- pressure from the sand made sand dome collapse on the sides causing grains to fall.
- width of the dome increased.
- Did not reach more than 2.5cm over.

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

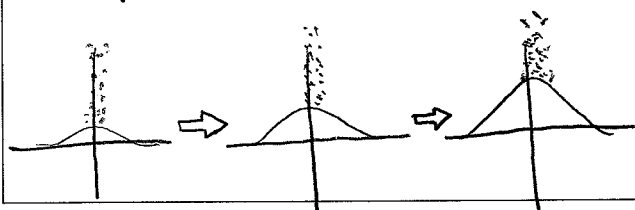
• The sand falls in to a small pile, like a little hill.

2. Estimate the maximum height of the pile after it is built 2 1/2 inches
(numbers on the scale in centimeters)
3. Estimate the angle (in degrees) of the side slope after pile is built 45°/135°
4. Describe the size of the pile as it builds – how does the pile increase in size?

It increases in both height and width.

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

yes, it becomes a more pointed hill as more sand falls.



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 3 inches
- other predictions:

✓ I think when more sand is dropped, the existing pile will crumble before it get larger.

Watch the second snip.

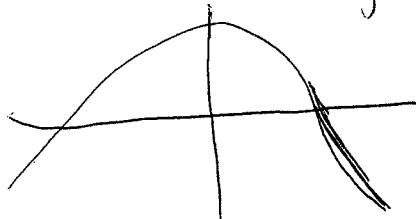
- 1) Put a check beside any prediction (above) you got substantially correct.
- 2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

• The sand rolled off of the sides of the existing pile, as more and more sand was dropped.

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
 - formed a small hill like a cone volcano
 - some of the sand bounced to outside of the base and didn't pile on
- Estimate the maximum height of the pile after it is built 2.25 cm
(numbers on the scale in centimeters)
- Estimate the angle (in degrees) of the side slope after pile is built 50°
- Describe the size of the pile as it builds – how does the pile increase in size?
increase in height and base width
- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

It does not change shape



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 2.5 cm ✓
- other predictions:
 - the shape will become more flattened and spread out like a shield volcano
- the base will increase the most ✓

Watch the second snip.

- Put a check beside any prediction (above) you got substantially correct.
- Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.


- It didn't collapse as dramatically as I thought it would.

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- it grows slowly
- the sand is mainly in a pile but there is ^{an} excess ring around the pile

2. Estimate the maximum height of the pile after it is built 2 centimeters
(numbers on the scale in centimeters)

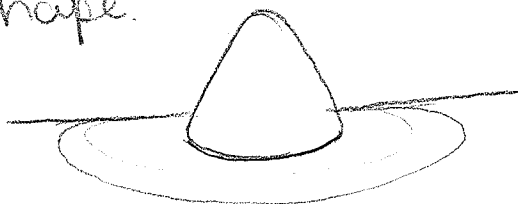
3. Estimate the angle (in degrees) of the side slope after pile is built 22° 

4. Describe the size of the pile as it builds – how does the pile increase in size?

it builds slowly.
because of collision
most sand is forced
to the bottom

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

it is in a rounded
cone
shape.



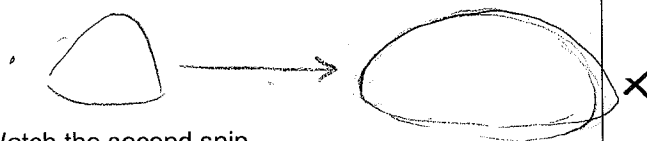
Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 2.5 centimeters ✓
- other predictions:

• the width is going to grow faster than the height ✓

• it will become more rounded ✓



Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

• the sand gets so heavy at the top it comes off in big waves making the pile stay the same in height

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
 - gets wider as it gets taller
 - sand from top rolls down
- Estimate the maximum height of the pile after it is built 2 mm
(numbers on the scale in centimeters)
- Estimate the angle (in degrees) of the side slope after pile is built 40-45
- Describe the size of the pile as it builds – how does the pile increase in size?
it gets wider at the bottom, creating a pyramid structure
- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.
– becomes pyramidal but started off more oval shape



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Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 2.5 - 3 mm ✓
- other predictions:
 - it won't get much taller but will get much wider ✓
 - there will be more of an angle ✓
 - it will become less like a pyramid

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- it still looked like a pyramid – I thought it would be more horizontal

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

- spatters first then piles
- dome shaped
- low viscosity
- particles stick together
- stacks then rolls

2. Estimate the maximum height of the pile after it is built 2 cm.
(numbers on the scale in centimeters)

3. Estimate the angle (in degrees) of the side slope after pile is built 45°

4. Describe the size of the pile as it builds – how does the pile increase in size?

particles stack then roll
down side
→

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

dome → triangle, volcano like



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 3.5 cm
- other predictions:
 - only half as high
 - width will increase ✓
 - no plattering ✓
 - attach to 1st sand pile ✓

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- part of pile slid under weight
- only "grew" .5 cm

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

1. Notes to myself as the pile builds (e.g., interesting observations).

• Stopped stacking around
20cms.

2. Estimate the maximum height of the pile after it is built 20cms
(numbers on the scale in centimeters)

3. Estimate the angle (in degrees) of the side slope after pile is built 45°

4. Describe the size of the pile as it builds – how does the pile increase in size?

Spreads outward first, as more sand is added, excess falls off the peak to eventually allow for more vertical buildup.

5. Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

Originally it was a bit more angular, but as it reached its maximum height it stayed consistent



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 20cm
- other predictions:

The angle may be less harsh, but I don't think it will get any taller

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

• Angle stayed the same, went up an additional 5 inches.

- Sheets of sand avalanched instead of the more single-grained fallout seen in the first video

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
Height is over the width so it is spread evenly
- Estimate the maximum height of the pile after it is built 2.3 centimeters
(numbers on the scale in centimeters)
- Estimate the angle (in degrees) of the side slope after pile is built 45
- Describe the size of the pile as it builds – how does the pile increase in size?
It's height and the width grows
- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

It's a pyramid shape.
Does not change shape



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 4 cm
- other predictions:
will be wider/taller
might make a small dent on the pile at first

Watch the second snip.

- Put a check beside any prediction (above) you got substantially correct.
- Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- was not expecting the sand to ~~roll~~ slide off the side of the pile

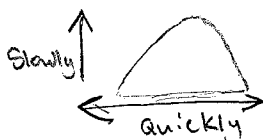
Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).
 - Sand bounces and spreads out
 - builds height quickly at first then gains more width after about 1cm
- Estimate the maximum height of the pile after it is built ~ 2.5 cm
(numbers on the scale in centimeters)
- Estimate the angle (in degrees) of the side slope after pile is built 45°
- Describe the size of the pile as it builds – how does the pile increase in size?

The pile increases height as well as width as the sand rolls and accumulates around the sides

- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

A cone with a circular base.



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = 3.5 cm
- other predictions:

✓ It will gain much more width than height when the second volume of sand is added

Watch the second snip.

- Put a check beside any prediction (above) you got substantially correct.
- Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- The sand only builds so high before falling down the sloped sides
- didn't gain much height only ~ 0.5 cm

Part I: observe, describe, estimate. Prof. Brande set up some laboratory equipment to drop a volume (about 25 ml) of clean, dry sand onto a flat surface. Watch as the pile builds, make notes, and address issues below.

- Notes to myself as the pile builds (e.g., interesting observations).

- slowly gets bigger
 symmetrical

- Estimate the maximum height of the pile after it is built 2.1 cm
 (numbers on the scale in centimeters)

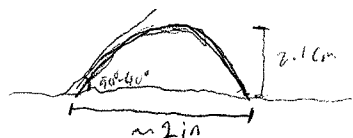
- Estimate the angle (in degrees) of the side slope after pile is built 40-50°

- Describe the size of the pile as it builds – how does the pile increase in size?

gets bigger at angle, forms
 a mound about 2 in

- Describe the shape of the pile as it builds – does the pile change shape, or not? Also, sketch a cross-section of the final pile.

mound, like a hill



Part II: prediction and assessment – a second volume of sand will be dropped on the existing pile.

1st make some predictions (bullet list) about the appearance (how will it be different, if at all?) and the size of the pile after the second volume of sand is poured onto its top.

- predicted height = ~3 cm
- other predictions:

1. might decrease degree of side of mound
 *are more flat
 2. could at first flatten top of mound

Watch the second snip.

1) Put a check beside any prediction (above) you got substantially correct.

2) Describe new appearances and motions that differed from your predictions, or that you noticed while watching but didn't anticipate.

- big chunks of sand fall

is 2.7 cm