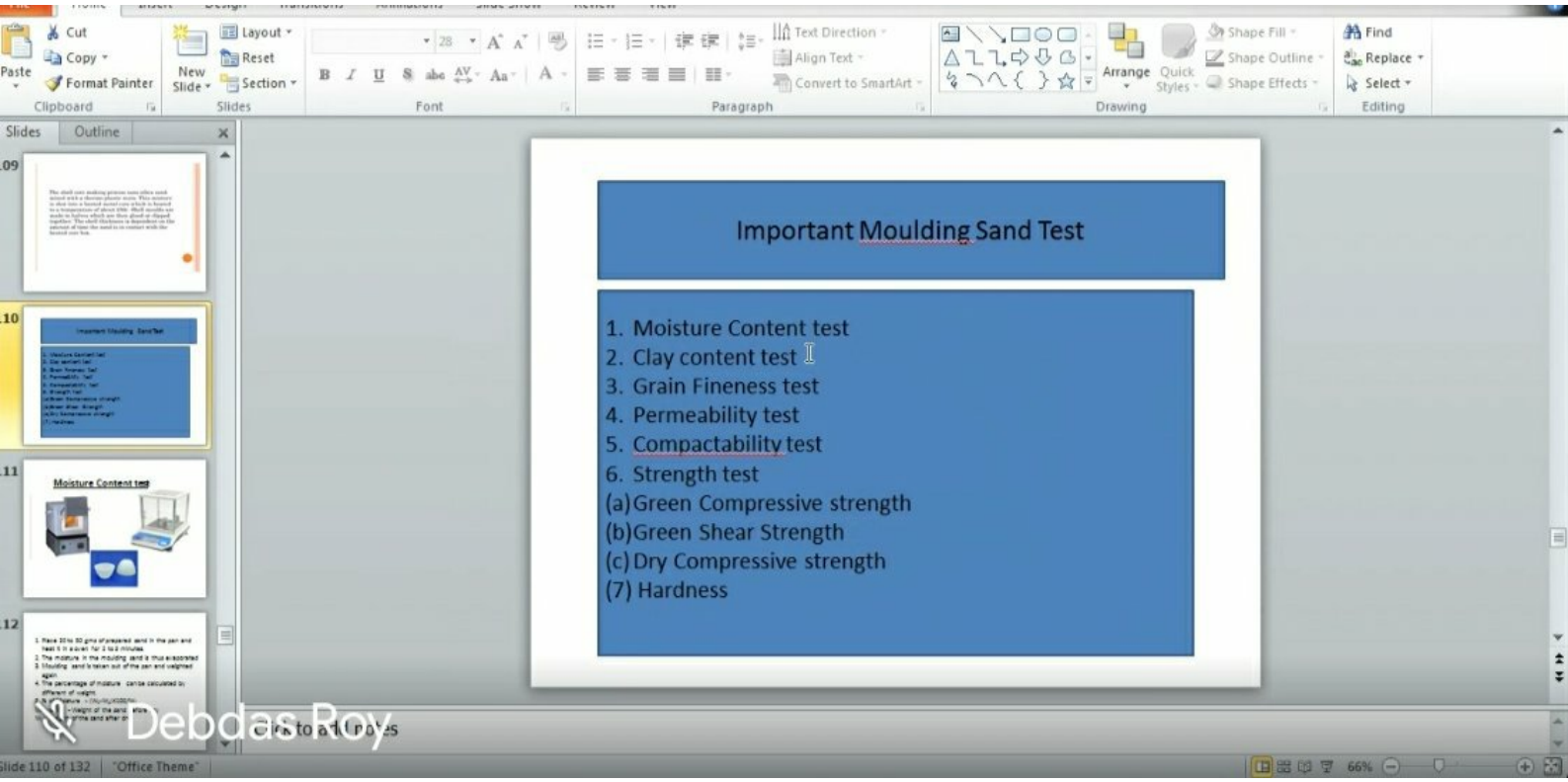
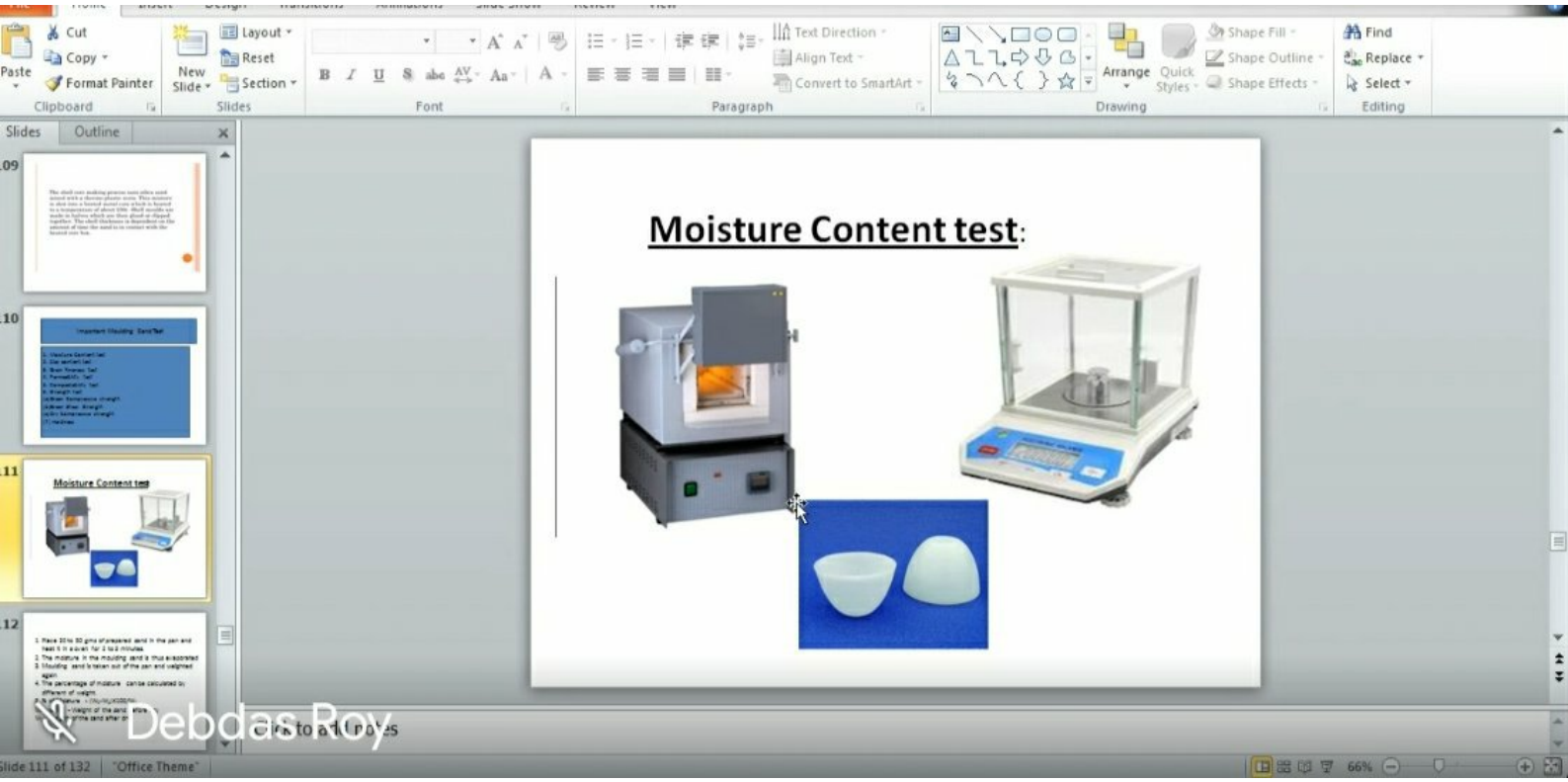

Important Moulding Sand Test
1. Moisture Content test
2. Clay content test
3. Grain Fineness test
4. Permeability test
5. Compactability test
6. Strength test
(a) Green Compressive strength
(b) Green Shear Strength
(c) Dry Compressive strength
(7) Hardness
Moisture Content test
Debdas Roy

1. Place 20 to 50 gms of prepared sand in the pan and heat it in a oven for 2 to 3 minutes.
2. The moisture in the moulding sand is thus evaporated
3. Moulding sand is taken out of the pan and weighted again
4. The percentage of moisture can be calculated by different of weight.
5. % of Moisture = $(W_1-W_2)X100/W_1$

Where W_1 = Weight of the sand before dry

W_2= Weight of the sand after dry

Debdas Roy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Moisture Content test:
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Rapid Moisture Teller:

When calcium carbide comes in contact with moisture, acetylene gas is generated . This principle is used in the Rapid moisture Teller

A weighted quantity of sand is mixed with a fixed quantity of calcium carbide reagent and the whole mixture is thoroughly shaken in a vessel to which a pressure gauge is fixed.

The acetylene gas produced develops pressure. The Instrument indicates moisture on the pressure gauge.

Debdas Roy

Clay Content Test (Total Clay)

1. Separate 50 gms of dry moulding sand transfer to wash bottle.
2. Add 475 cc of distilled water + 25cc of a 3% NaOH
3. Agitate this mixture for 10 min with the help of sand Stirrer.
4. Fill the wash bottle with water upto marker.
5. After the sand etc has settled down the water Siphon from the wash bottle.
6. Dry the sand settled down

Now the % of clay content can be calculated

% of clay content = $(W_1-W_2)X100/W_1$

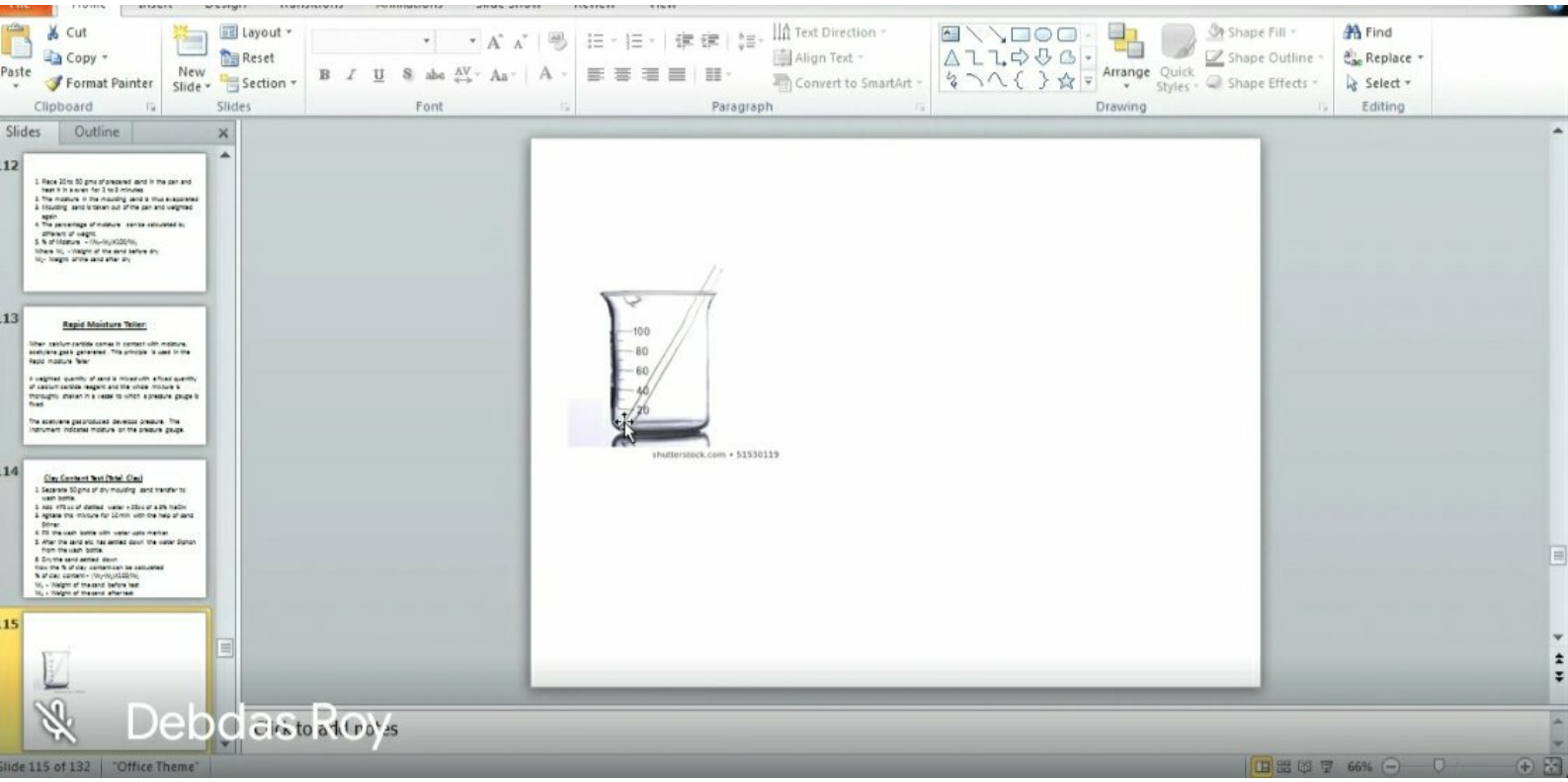
W_1 = Weight of the sand before test

W_2 = Weight of the sand after test.

Debdas Roy

Kalyanmoy

2 others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Rapid Moisture Teller:
Clay Content Test (Total Clay)
100
80
60
40
20
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Clay content test (Active clay)

- Methylene Blue Test

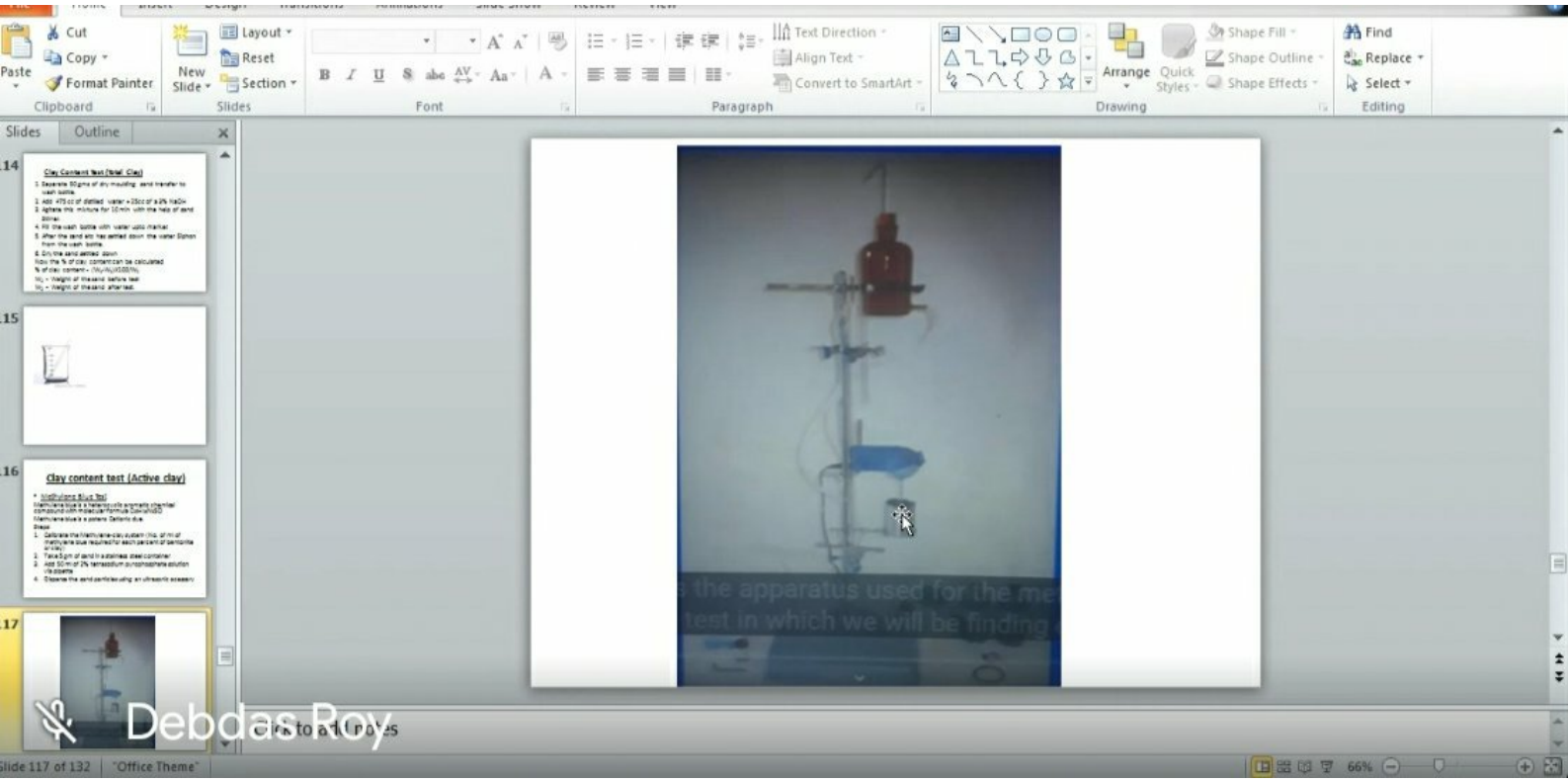
Methylene blue is a heterocyclic aromatic chemical compound with molecular formula $C_{16}H_{18}N_3SCl$

Methylene blue is a potens Cationic dye.

Steps:

1. Calibrate the Methylene-clay system (No. of ml of methylene blue required for each percent of bentonite or clay)
2. Take 5 gm of sand in a stainless steel container
3. Add 50 ml of 2% tetrasodium pyrophosphate solution via pipette
4. Disperse the sand particles using an ultrasonic acessary

Debdas Roy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Clay Content Test (Total Clay)
Clay content test (Active clay)
Methylene Blue Test
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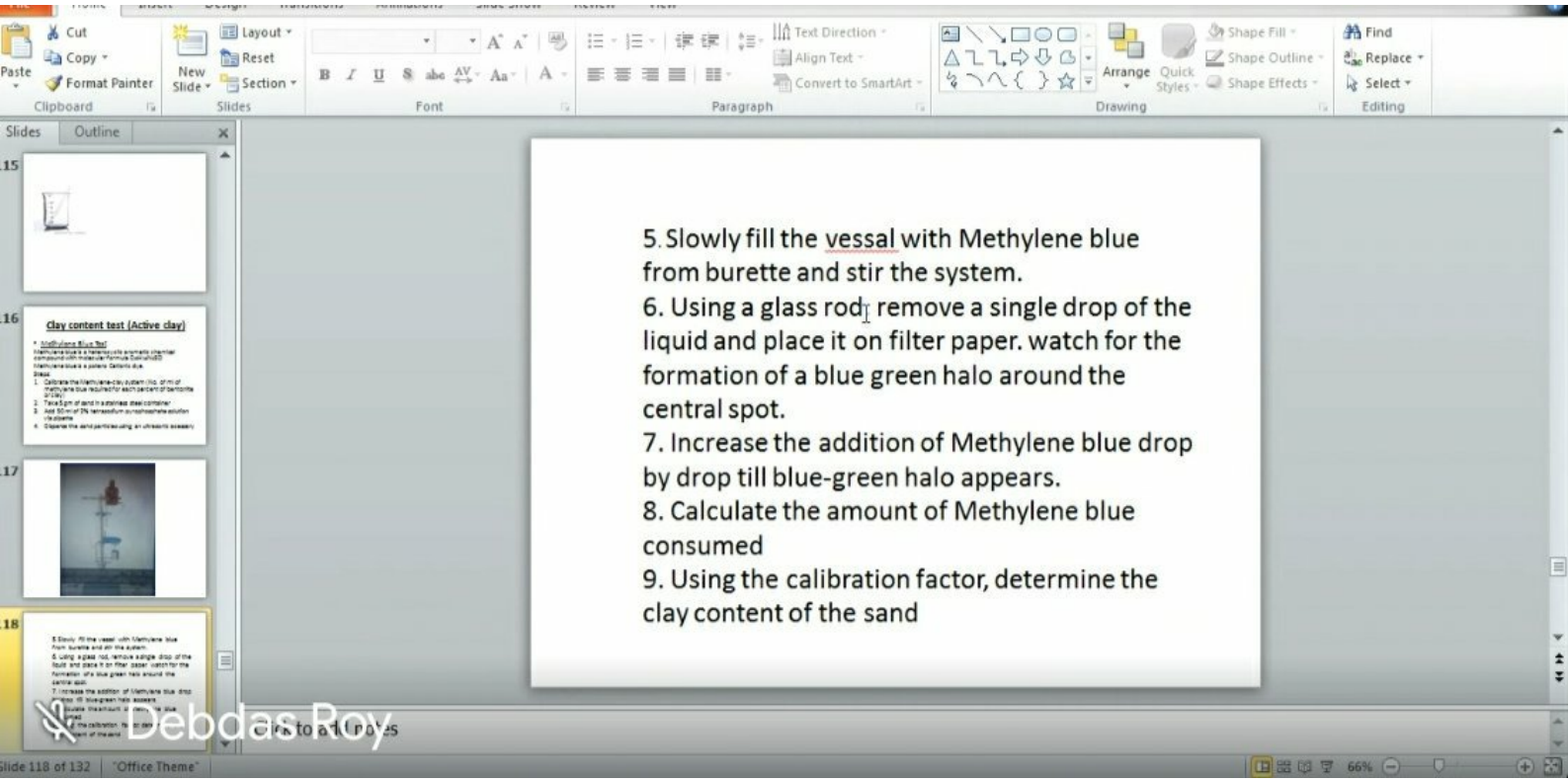
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Clay content test (Active clay)
5. Slowly fill the vessal with Methylene blue from burette and stir the system.
6. Using a glass rod remove a single drop of the liquid and place it on filter paper. watch for the formation of a blue green halo around the central spot.
7. Increase the addition of Methylene blue drop by drop till blue-green halo appears.
8. Calculate the amount of Methylene blue consumed
9. Using the calibration factor, determine the clay content of the sand
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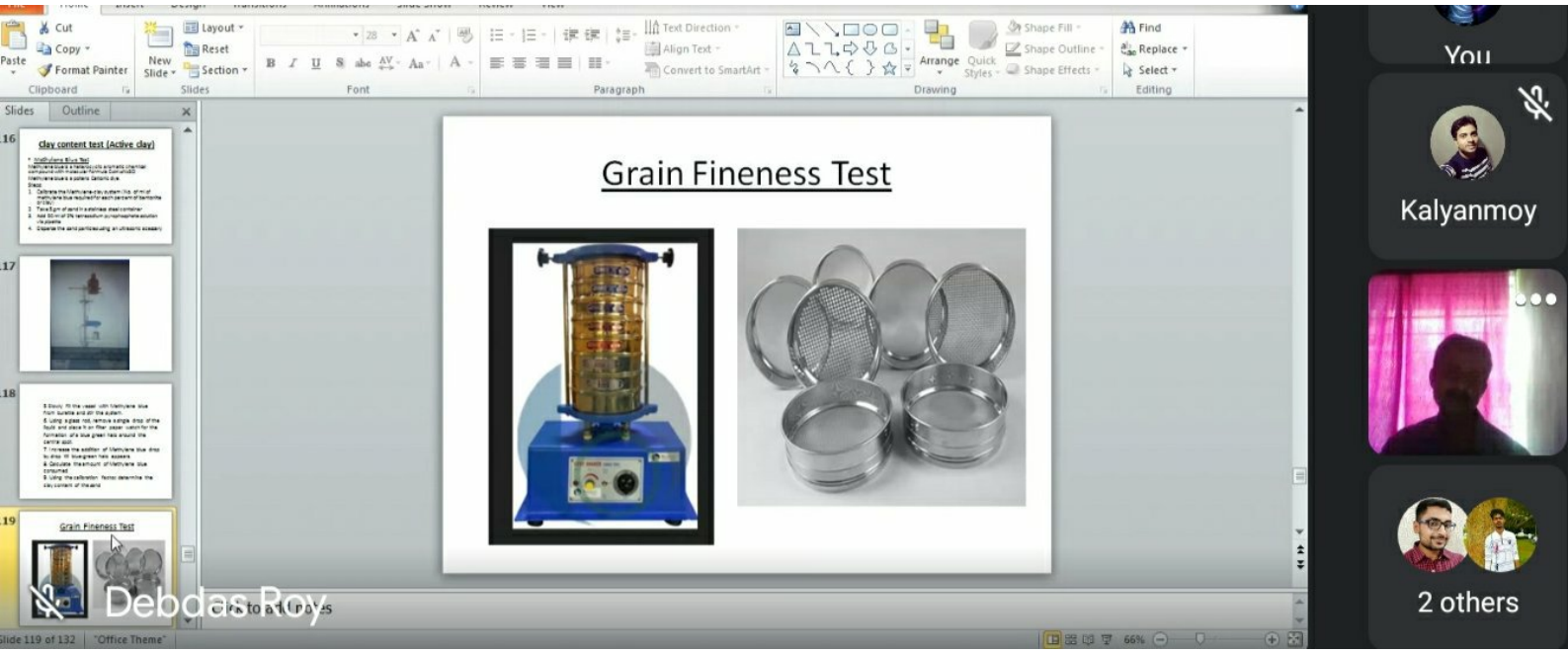
Grain Fineness Test
Debdas Roy
You
Kalyanmoy
2 others

- Place the sample of dry sand (Clay removed sand) in the upper sieve
- Vibrate the Sieve shaker for a definite period.
- Weigh the amount of sand retained on each sieve
- Compute the percentage distribution of grains.

A sample of 50 gms of moulding sand was sieved through a sieve shaker. The quantities of sand collected in different sieve were recorded. Determine AFS grain fineness number(GFN) of the said sand

US Sieve Serial no	Sand retained On each sieve(gm)	% of sand retain (A)	Multiple factor (B)	Product (AXB)
6	none	0.0	3	0
12	none	0.0	5	0
20	none	0.0	10	0
30	none	0.0	20	0
40	0.20	0.40	30	12
50	0.65	1.3	40	52
70	1.20	2.4	50	120
100	2.25	4.5	70	315
140	8.55	17.1	100	1710
200	11.05	22.1	140	3094

odas Roy

GFN =Sum of products/Sum of % weight of sand retained
= 15243/88.2 =172.8 ≈ 173

Permeability Test:

The quantity of air that will pass through a standard specimen of the sand at a particular pressure condition is called the permeability of the sand

Major part of Permeability test equipment

1. An inverted bell Jar, which floats in a water
2. Specimen tube (for holding the sand specimen)
3. Manometer (for measuring the air pressure)

Step involved;

1. The air (2000 cc volume) held in the bell jar is forced to pass through the sand specimen
2. At this time, air entering the specimen is equal to the air escaped through the specimen
3. Take the pressure reading in the manometer
4. Note the time required for 2000 cc of air to pass the specimen

odas Roy

Permeability number (N) = VH/APT

Where, V = Volume of air (cc)

H= Height of the Specimen (cm)

A = Area of the Specimen (cm^2)

P = Air pressure (gm/cm^2)

T = Time taken by the air to pass through the sand Specimen (Sec)

- Determine the permeability a AFS sandard sand specimen of 5.08 cm (2 inch) diameter and 5.08 cm in height. The air drum was raised to take 2000 cm^3 of air into it. The whole air was then allowed to escape through the sand specimen at a pressure of 10g/cm^3 in a span of 15 sec.

Compactibility:

The compactibility indicates the water tempering degree of the green sand moulding Compactibility is the percentage decrease in height of a loose mass of sand under the influence of a controlled compaction

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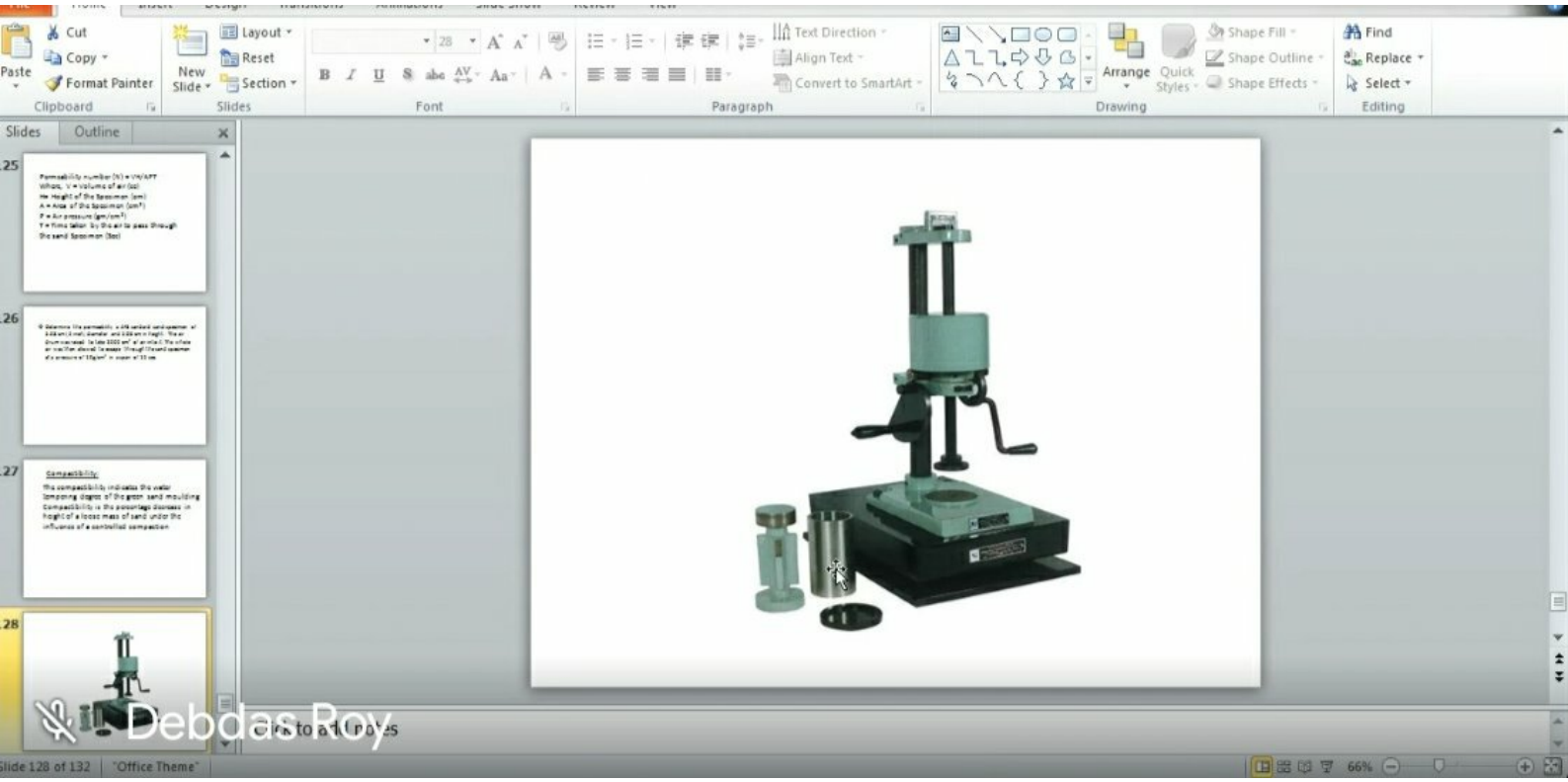
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Green Compression Strength:
Green Compression Strength indicates the load bearing capacity of the mould in the presence of moisture

Green Shear strength:
Green Shear strength indicates the strength indicates the strength of the mould during the removal of pattern or while the core in the mould

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You

Kalyanmoy

2 others

Universal sand strength Testing Machine

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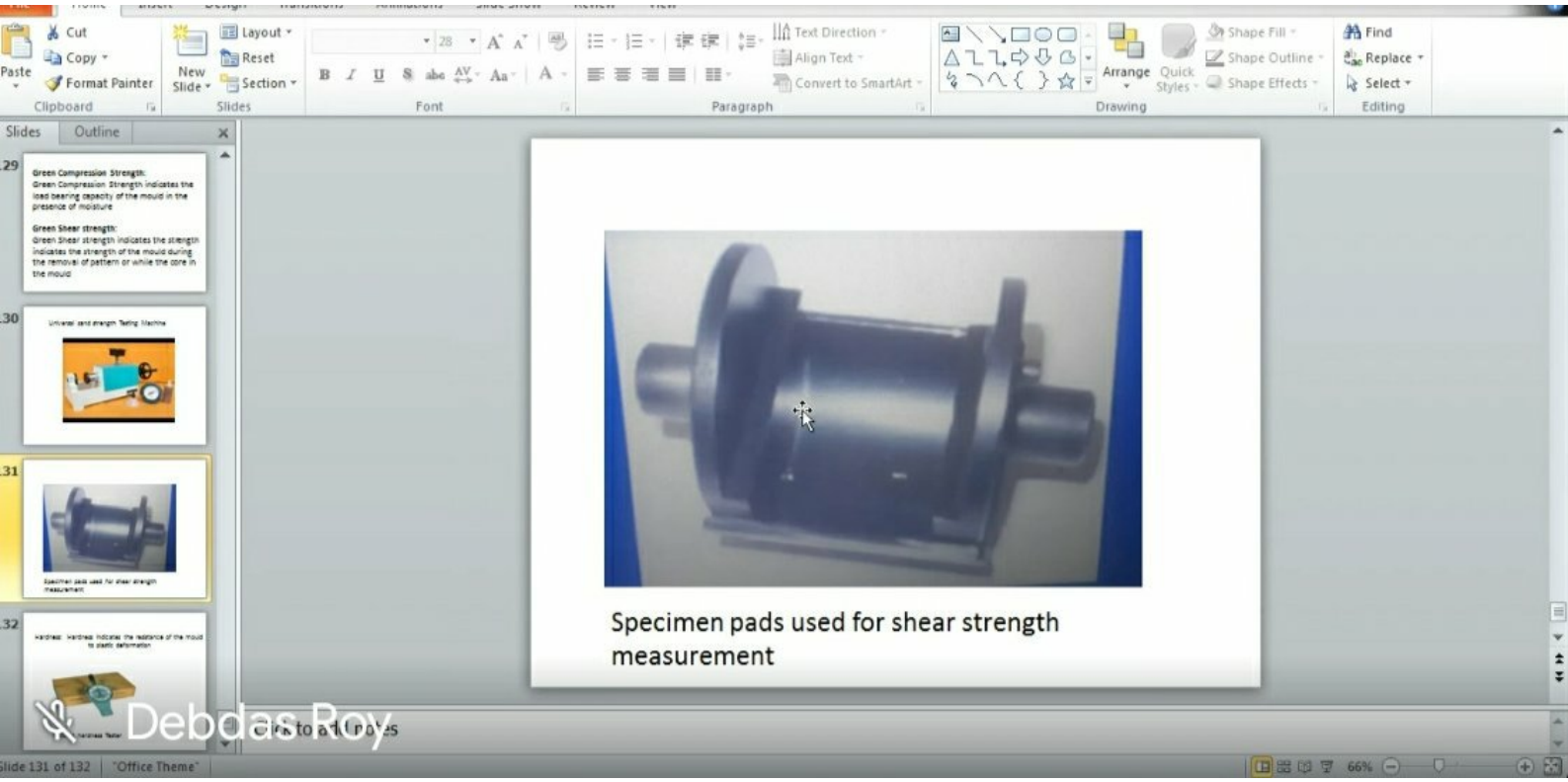

Specimen pads used for shear strength measurement

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Hardness: Hardness indicates the resistance of the mould to plastic deformation

Mould hardness Tester

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