

Blood & Blood Spatter (ch 8)

(1) Composition of Blood - 3 types of blood cells suspended in a liquid called plasma.

A. Platelets - (thrombocytes) - aid in clotting blood & repairing damaged blood vessel.

B. White Blood Cells (leukocytes) - fight disease & foreign invaders (viruses & germs)
- only blood cells to contain dna

C. Red Blood Cells (erythrocytes) - carry oxygen & carbon dioxide throughout your body
- contain hemoglobin - red iron-containing compound
- contain antigens on their surface - a protein that stimulates the body to produce antibodies.

- antibody - protein in blood that destroys/inactivates antigens

- antiserum - blood serum that contains specific antibodies

- agglutination - clumping together of red blood cells by antibodies

see slide 1.1

(2) Blood Typing (Serology - study of antigen-antibody reactions)

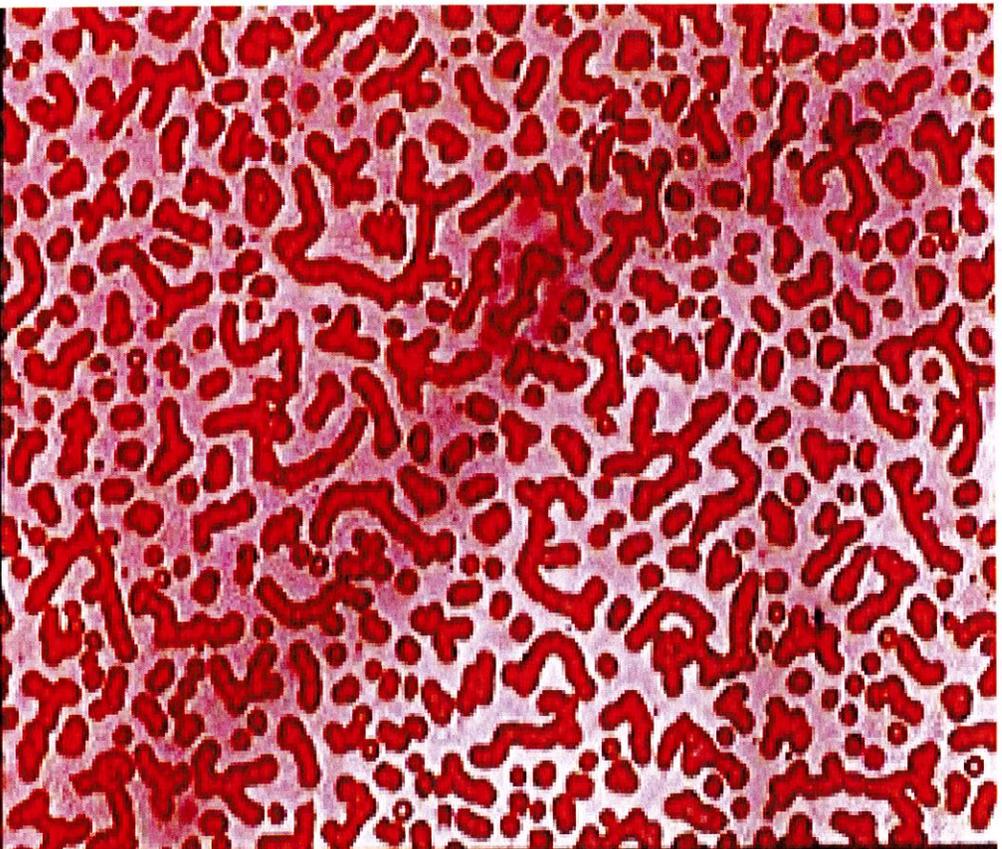
A.

<u>Blood Types</u>	<u>Antigens on red-blood cells</u>	<u>antibodies in serum</u>	<u>% of us Population</u>
A	A protein	anti - B	42%
B	B protein	anti - A	12%
AB	both	none	3%
O	none	both	43%

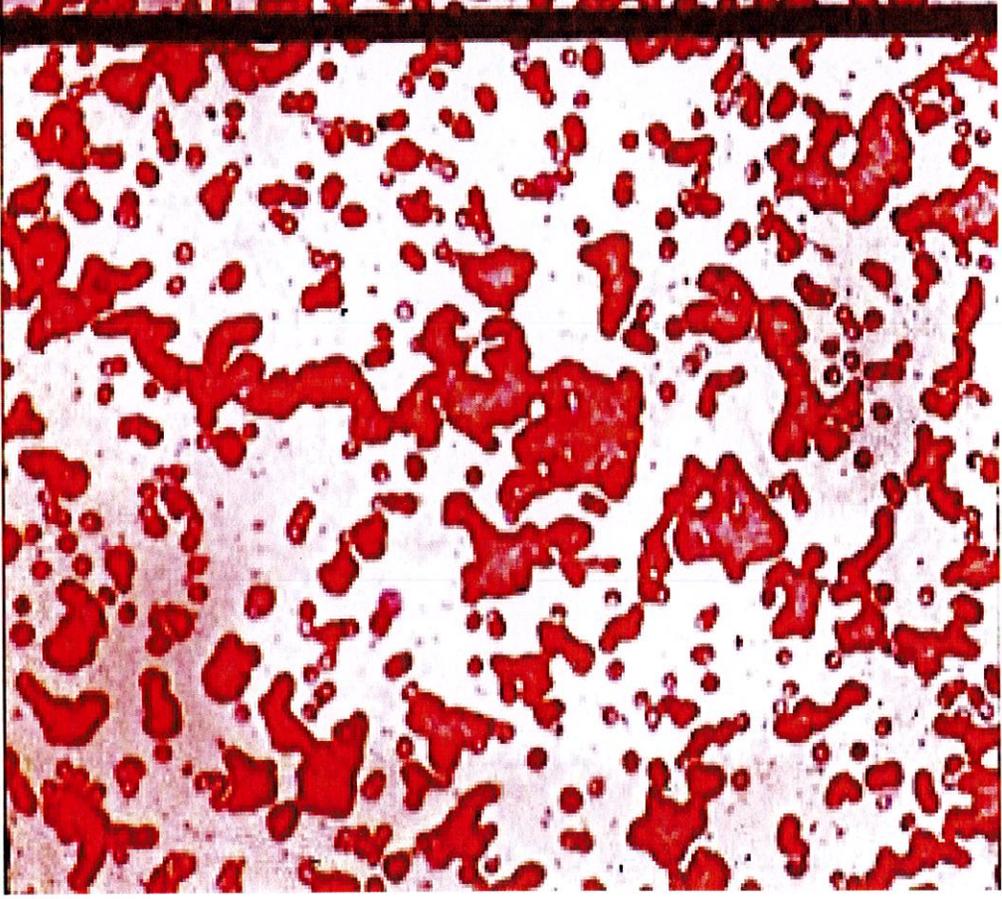
B. Rhesus factor (Rh factor)

85% of people have the Rh factor - called Rh +
15% of people do not have Rh factor - called Rh -

Normal Red Cells



Agglutinated red cells



C. Blood Typing Tests - 3 separate tests are performed

- (1) blood + antibodies that bond to antigen A
- (2) blood + antibodies that bond to antigen B
- (3) Rh factor

Agglutination?

Yes, Type A

Yes, Type B

3. Blood Spatter

A. See slide 2.1

B. Spatter - patterns in blood, used to determine the direction, height, & angle of impact, & origin (area of convergence)

1. Blood spatter classification. see slide 2.2

2. Directionality

a. forces that affect direction of blood drops

(1) cohesion - attractive force b/w 2 similar substance

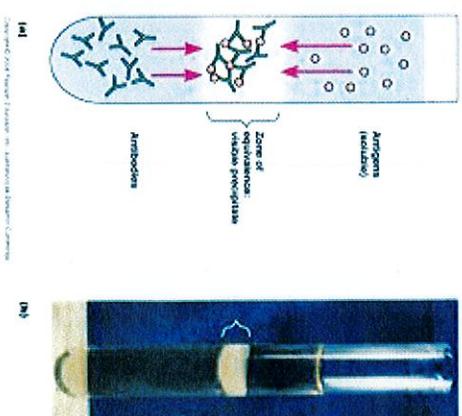
(2) adhesion - attractive force b/w 2 unlike substance

(3) surface tension - attractions b/w molecules w/i 1 substance

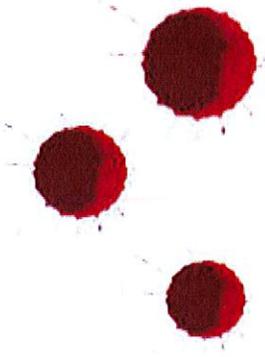
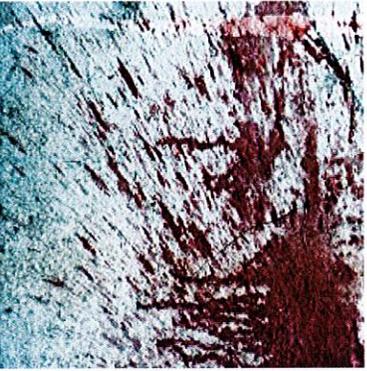
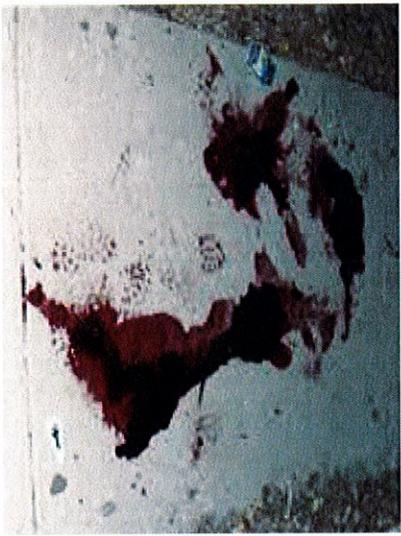
b. impact angle / see slide 2.3 - 2.6
point of origin

A. 3 Tests for Blood Evidence

- Kastle-Meyer color test – tests for the presence of hemoglobin (red blood cell protein) that has a peroxidase-like activity.
- Luminol – reacts to blood to emit light and thus requires the result to be observed in a darkened area.
- Precipitin Test – an antibody that reacts with its corresponding antigen to form a precipitate to distinguish animal from human blood.

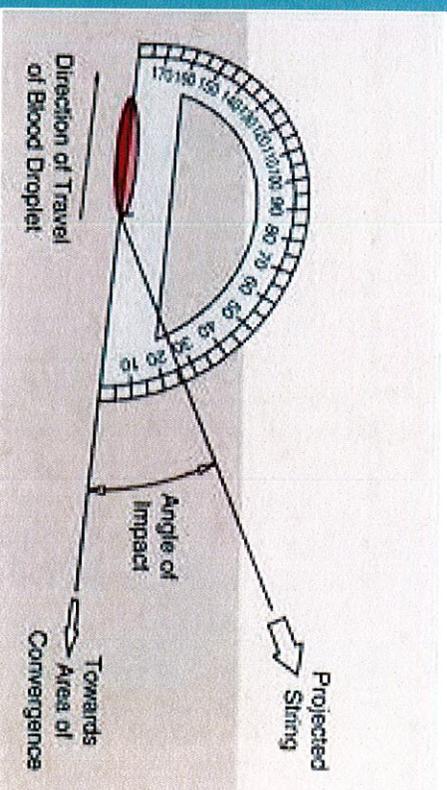
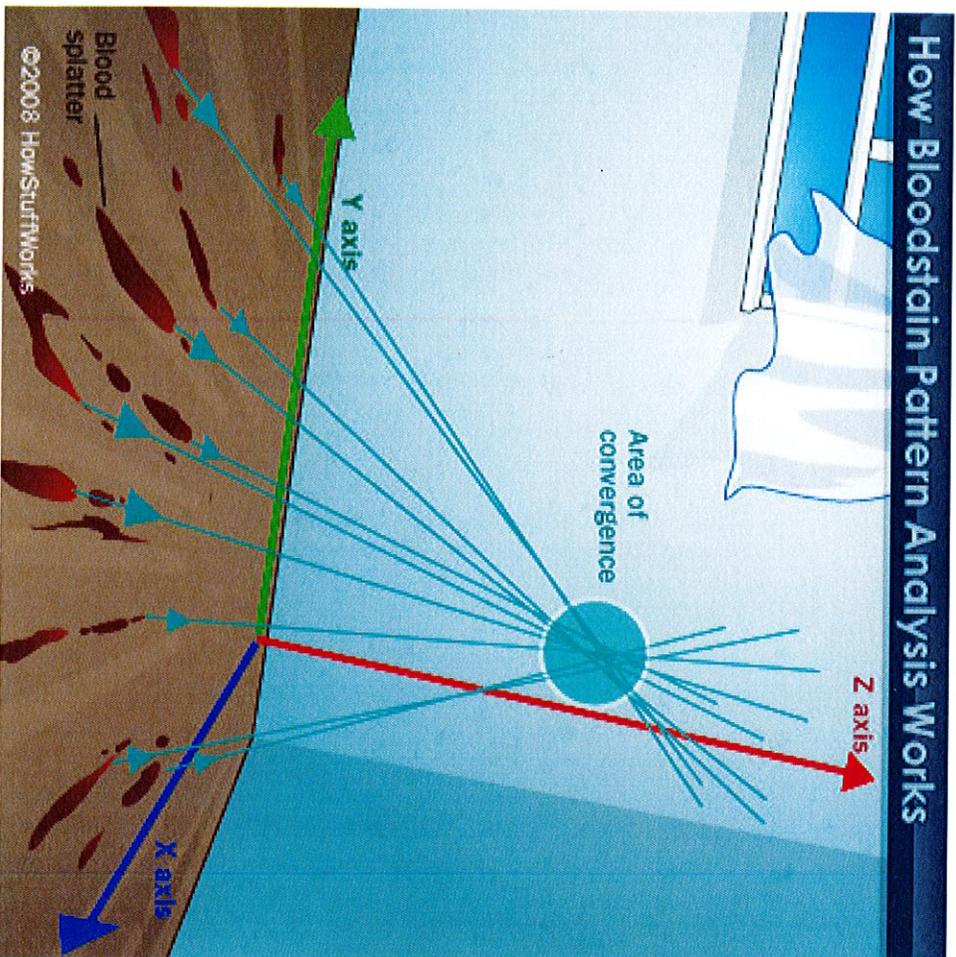


1. Blood Spatter Classifications

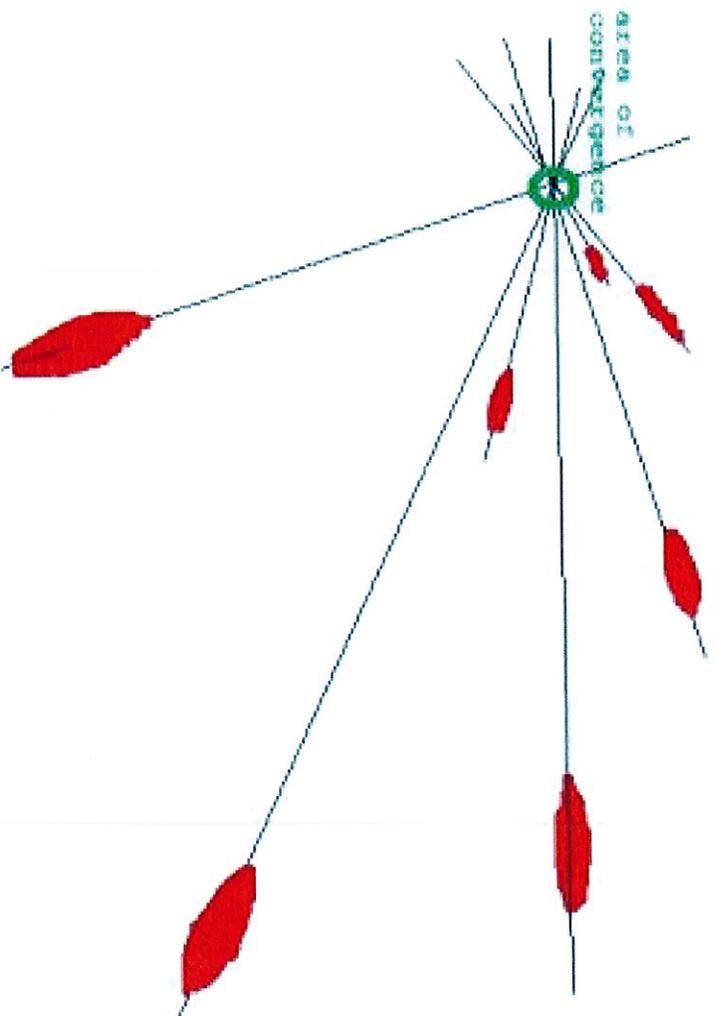
<p>Passive fall</p> 	<p>Splashes</p> 	<p>Trails</p> 
<p>Arterial spurts</p> 	<p>Smears</p> 	<p>Pools</p> 

b. impact angle / point of origin

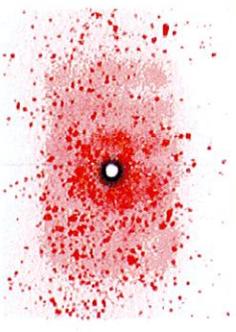
Point of Origin

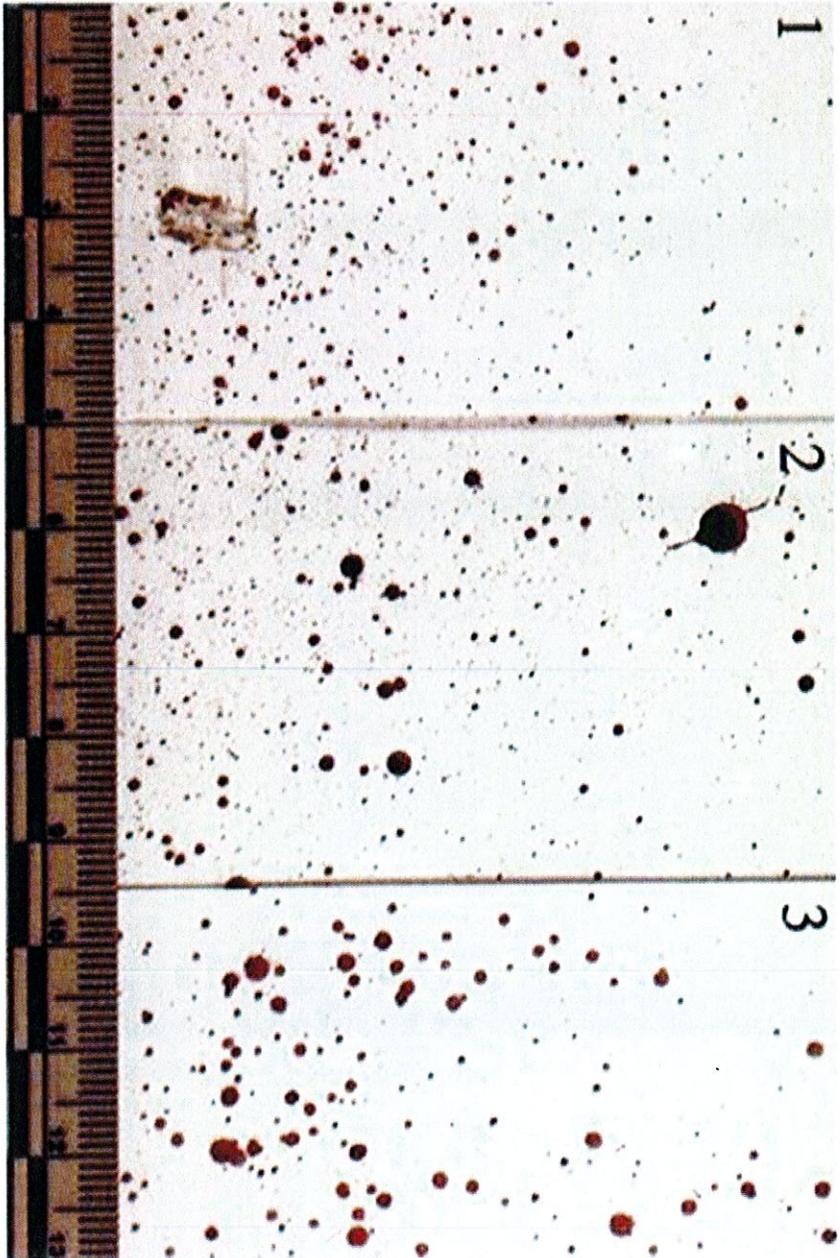


a. Area of Convergence



d. Blood Spatter Types

Velocity	Size of Droplets	Visual Image	Velocity of Blood	Examples of Injuries
High	Less than 1 mm		100 ft/sec	Gunshot wounds
Medium	1-4 mm		25 ft/sec	Beating, stabbing
Low	4-6 mm		5 ft/sec	Blunt object impact



Slide 2.4