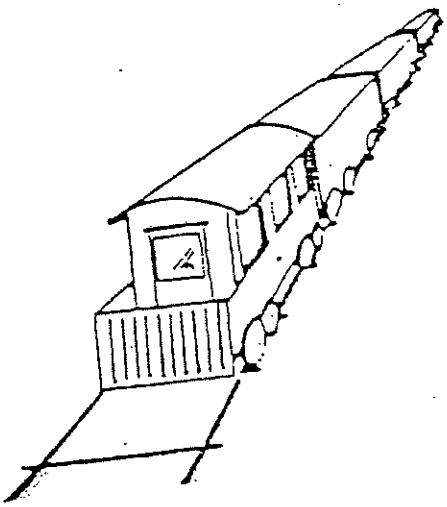
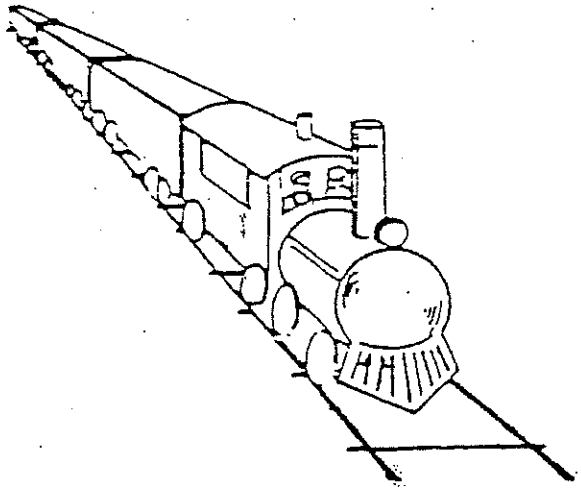
Name: Hour:

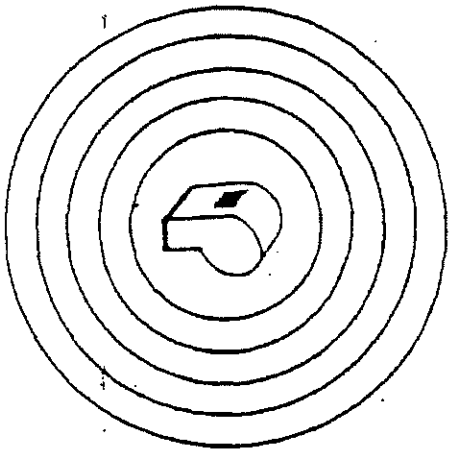
The Doppler Effect

1. Have you ever noticed the change in pitch that occurs as a moving train whistles or a fire engine siren passes you? The higher pitch produced by an approaching sound-maker is the result of sound vibrations crowding together in front of the sound-maker. Vibrations reach your ear closer together and you hear a higher pitch. The lower pitch produced by a sound-maker is the result of sound vibrations spreading out behind the sound-maker. Vibrations reach your ear farther apart and you hear a lower pitch. If a vibrating object is moving, sound waves crowd together in front to produce a high pitch and spread apart behind to produce a low pitch.





2. Let's use circles to represent vibrations from a whistle. The circles get bigger and bigger as the vibrations move out from the whistle. How many vibrations are shown for this whistle?



3. Suppose the whistle is not moving. Observers on all sides of the whistle hear the same pitch because the same numbers of vibrations reach each observer in a given period of time.