

# MOTION GRAPHICS

## BITE 3623

6.3

## Digital Photography and Video

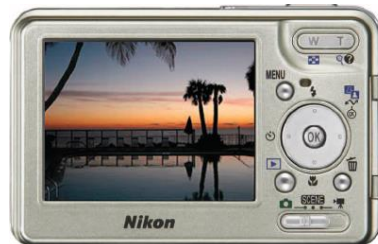
Key Terms

- *Photo-editing Software*
- *Video-editing Software*

I'm Stopping Here, But read carefully on your own. You'll see at least four questions from the next two sections on your exam.

## Digital Photography

- Digital photos are created, or acquired, using a digital camera or scanner and are saved as bit-mapped images.



Feature
Resolution
Price
Lens type
Storage media
Photo file format
Interfaces
Exposure controls
Focus controls
Flash modes
Software
Multimedia
Other useful features
Battery

## Photo Editing

- **Photo-editing software**, such as Adobe Photoshop Elements and Microsoft Picture It!, includes special tools and effects that you can use to improve or manipulate bit-mapped photograph images.



Today's technology makes it easy to create realistic looking faked photos – thus photos are no longer trusted as evidence in court.



## Digital Video

- Digital video cameras, called digital camcorders, are available in a wide range of prices with wide-ranging capabilities.

[Camcorder Buying Guide](#)



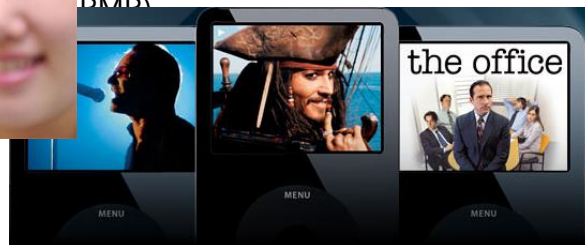
## Video Editing

- **Video-editing software** allows professional and amateur videographers to edit bad footage out and rearrange the good footage to produce a professional-style video production.



Video editing storyline

## Portable Digital Video Hardware



# Interactive Media

## Key Terms

- *Interactive media*
- *Video game consoles*
- *Interactive TV*



# Interactive Media

- ***Interactive media*** refers to digital media presentations that involve user interaction for education, training, or entertainment.

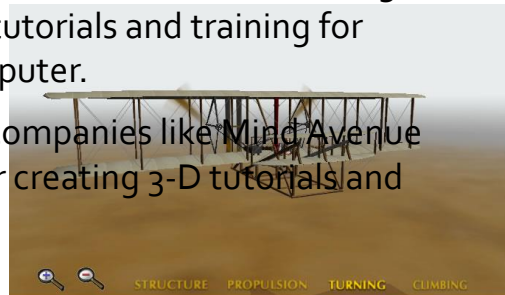
[Example: Digital Media for Work and Leisure, Army's Virtual World](#)



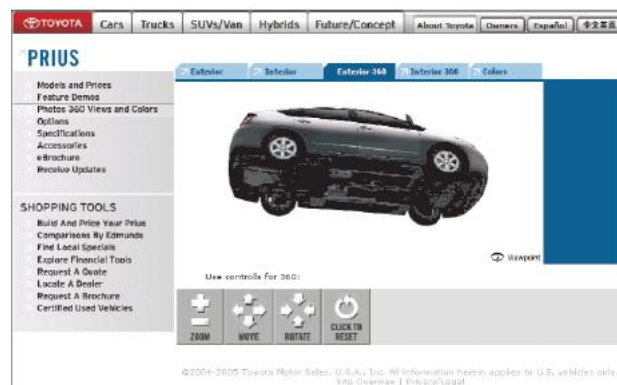
## Interactive Media in Education

- Authorware provides a toolkit for creating interactive 2-D tutorials and training for delivery on computer.
- Software from companies like Mind Avenue provide tools for creating 3-D tutorials and training.

<http://www.mindavenue.com>



## Interactive Media in E-commerce



<http://www.toyota.com/prius>

## Game Consoles

- **Video game consoles**, such as the Nintendo GameCube, the Sony Playstation 2 (PS2), and Microsoft's Xbox, are high-powered multiprocessor computers designed to support 3D interactive multimedia.



## Portable Gaming Hardware



## Interactive TV

- **Interactive TV** is a digital television service that includes one or more of the following:
  - Video on demand
  - Personal video recorder
  - T-Commerce
  - Internet access on TV
  - Video games over TV

## The Media Center PC

- [Windows XP Media Center Edition](#) runs on media PCs to provide the following services:
  - Television Receiver
  - Electronic program guide
  - Web browser
  - Personal video recorder
  - DVD Player
  - Digital Music Player
  - Digital Personal Photo and Video Library





## SLR

(Single-Lens Reflex)

## DSLR

(Digital Single-Lens Reflex)



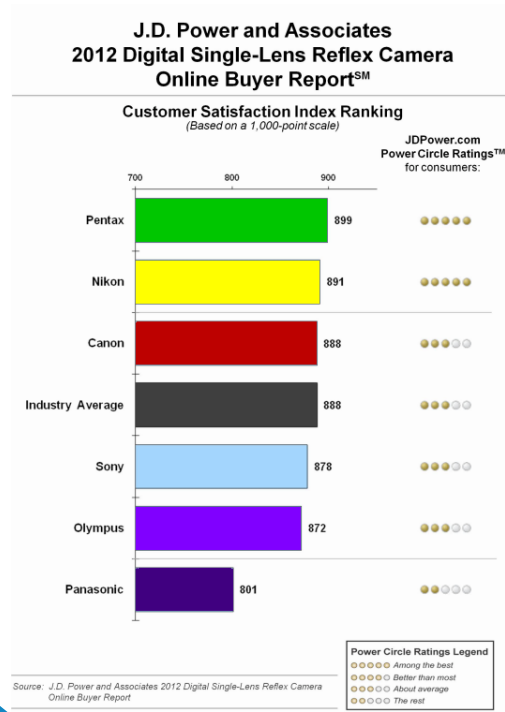
SOURCE

✓ 35mm  
Film

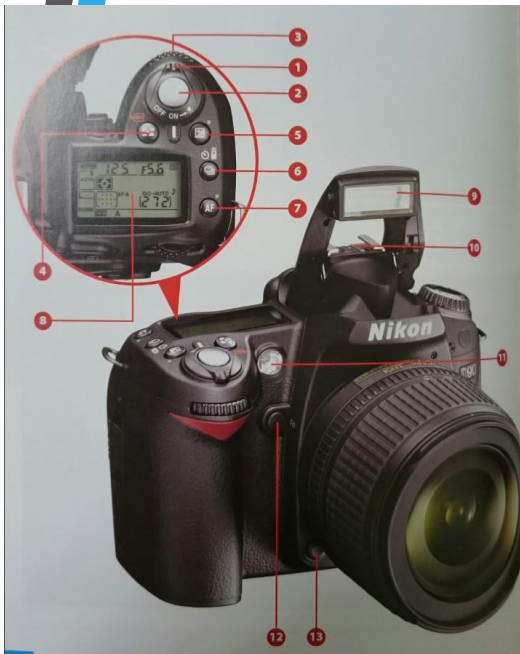
✓ Memory  
Card

## Questions to ask yourself

- Lenses come in every imaginable size, shape and price tag.
- What brand of lens should you buy?  
Nikon, Canon, Sigma, Tamron, Tokina
- What focal length lenses would best cover your photographic needs?
- Do I buy a zoom lens or fixed focal length lens?



## Activity



- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.



# Lenses



Why so many lenses and which one is right for me?



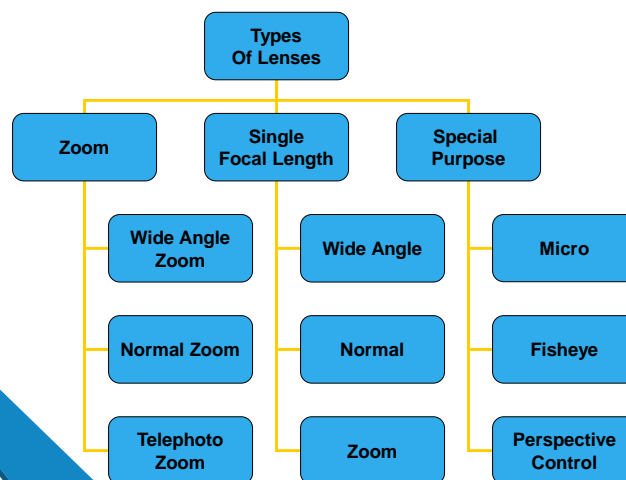
By John Munno, presented to the Oxford Greens Camera Club

## Type of Lens

Number of lenses optimized for APS-C sensors



Camera Lenses are classified into 3 major categories. Today we are going to learn about the different category of lenses and how to effectively use them to achieve desired results.



### Zoom Lenses

Zoom Lenses provides variable focal length of specific ranges, it allow the user to adjust its focal length on the lens without having to move its position. It is further broken down into 3 sub-categories, namely, Wide-Angle Zoom, Normal Zoom and Telephoto Zoom. As the names suggest, the functions of each type of lenses are as described. Below are some of the examples of the range of focal length in each type. *Click on Image to visit WEB-LINK.*

Wide-Angle Zoom



14mm-24mm Focal Length

Normal Zoom



24mm-70mm Focal Length

Telephoto Zoom



70mm-200mm Focal Length

### Single Focal Length Lenses

The functions of Single Focal Length Lenses are similar to that of Zoom Lenses, the difference is that the focal length are non-variable. Which means user will have to move its position in order to frame the subject accordingly. It is also further broken down into 3 sub-categories, just like the Zoom Lenses, namely, Wide-Angle, Normal and Telephoto. Below are some of the examples of the range of focal length in each type.

*Click on Image to visit WEB-LINK.*

Wide-Angle



24mm Non-Variable

Normal



50mm Non-Variable

Telephoto



300mm Non-Variable

### Special Purpose Lenses

Special purpose lenses are meant for specific purposes, they are classified as Fisheye, Micro and Perspective Control. As the name suggested, a Fisheye lens will give high distortion to the subject. Micro Lens are used to focus on objects that are small and needs detailing and Perspective Control allows user to minimize distortion to subject by changing it tilt angle. These lenses are also of non-variable focal length. Below are some of the examples of the range of focal length in each type. *Click on Image to visit WEB-LINK.*

Fisheye



16mm Non-Variable

Micro



85mm Non-Variable

Perspective Control



85mm Non-Variable



### Special Purpose Lenses

Below are some of the pictures taken with the Special Purpose Lenses.

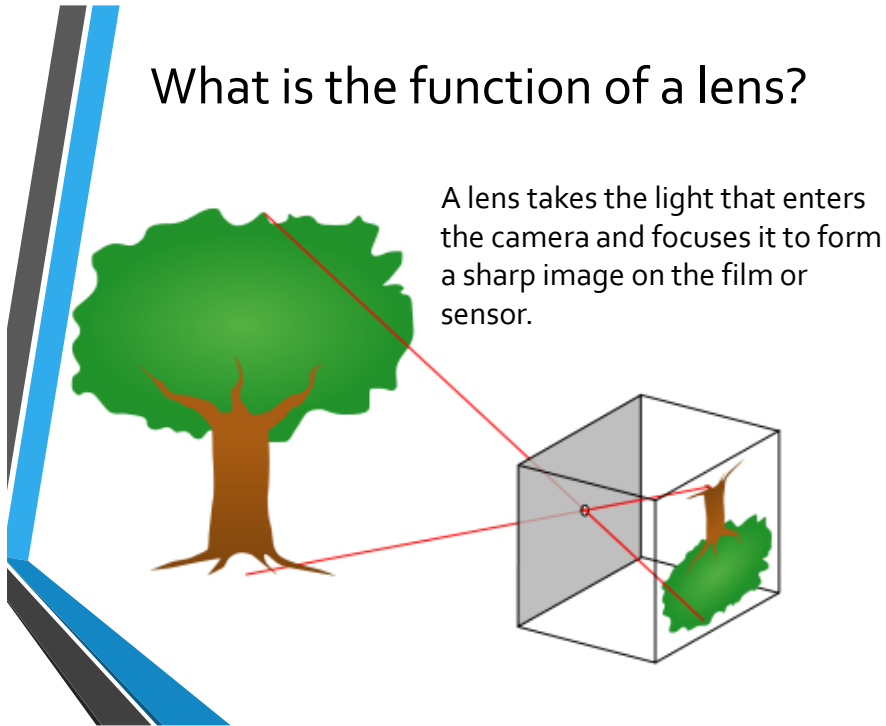


Photo with perspective control

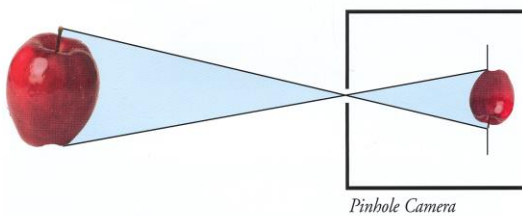


Photo without perspective control

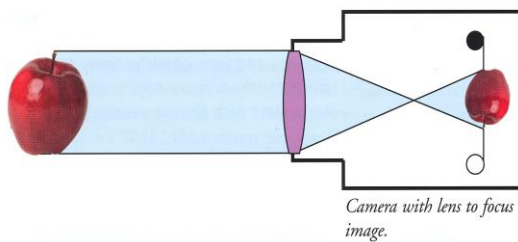
## What is the function of a lens?



## Pin hole vs. lens



- 1) Image formed on the film is not tack sharp.
- 2) Only a small amt of light enters through the pinhole



- 1) A lens focuses the light rays to produce a sharp image on the film or sensor
- 2) A lens admits larger amounts of light permitting proper exposures in a small fraction of a second.



## Two fundamental elements of a camera lens

- 50mm f/2.8 lens, 55-200mm f/4-5.6
- Focal Length: Determines the magnification of the image. Measured in Millimeters. ex. 50 mm, 200 mm, 18-105 mm.
- Aperture: The size of the opening in the lens (measured in f stops or fractions. (ex. f/2.8, f/3.5, f.8, f/3.5-5.6)



## Focal Length

- Focal length represents the distance from the optical center of a lens to the digital camera sensor when the subject is in focus.
- The smaller the mm number, the closer you can be to your subject for it to be in focus.



## Image size and focal length



24 mm



150 mm



35 mm



200 mm



50 mm



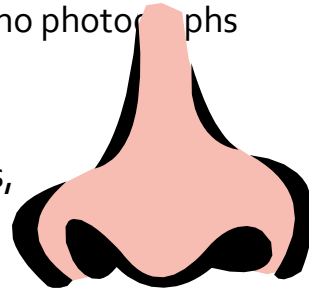
300 mm

## Primary lens categories and their focal lengths

Lens Type	Focal Length	Best Use
Wide Angle	28mm or lower	Landscapes and Interiors
Standard	35-85 mm	Portraits
Telephoto	100mm-300mm	Portraits and Sports
Super-Telephoto	300 mm or higher	Wildlife and sports

## Wide angle lenses

- Wide Angle Lenses are ideal for landscape photographers that want to capture all the scenery in front of them. These lenses can capture virtually everything that your eyes see in front of you from the ground at your feet to the mountains and in the distance.
- They are also good for someone who photographs indoors.
- They are not good for portraits because they distort facial features, making big noses!



## Standard Lens

- Good for a wide range of photographic needs but excel at portraits
- Lenses in the 50 mm to 75 mm range create natural looking portraits without facial distortions.



## Telephoto Lens

- Work well with portraits but also cause some distortion, the longer the focal length of the lens, the more it compresses the visual space. Can't tell the distance between objects.
- Good at getting close up views of objects that are far away. Good for sports and wildlife.



## Super Telephoto Lens

- Exclusively the domain of professional photographers.
- These lenses are very expensive
- They are used by wildlife photographers where getting close up to the subject is not possible.
- Also used for professional sporting events.

## Prime Lens vs. Zoom lens

- Prime lenses have a fixed focal length
- If you want to change the size and angle of your subject you have to physically move closer or further away.
- They take clearer pictures than zoom lenses (no moving parts like a zoom lens)
- They are lighter than zoom lenses (good for traveling)
- They are less expensive than zoom lenses

## Zoom Lenses

Zoom Class	Range
Wide angle to Wide angle	10mm-28mm
Wide angle to telephoto	28mm-300mm
Telephoto to Telephoto	100mm-600mm
Super Zoom	18mm-300mm



## Zoom Lens

- Variable focal lengths ex. (18mm-105mm)
- Can cover the distance of 2-3 prime lenses
- Most common lenses for SLR cameras today
- Don't have to move your body or the camera to change the image. You can simply zoom your lens in or out.



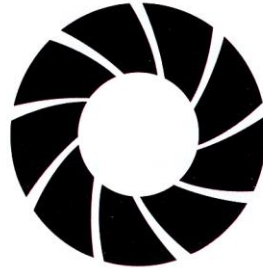
## Aperture

- Aperture is the size of the lens opening that lets in more or less light.
- The smaller the aperture number or f stop the larger the opening.
- Smaller aperture lenses let in more light. They are sometime called fast lenses. They cost more.
- The smaller the aperture, (larger the opening inside the lens) the more expensive the lens.

## Apertures



$f/1.4$



$f/8$



$f/16$

## Apertures

- Standard scale for lens apertures
- $f/1.4, f/2.0, f/2.8, f/4.0, f/5.6, f/8, f/11, f/16, f/22, f/32$



$f/2.8$



$f/4$



$f/5.6$



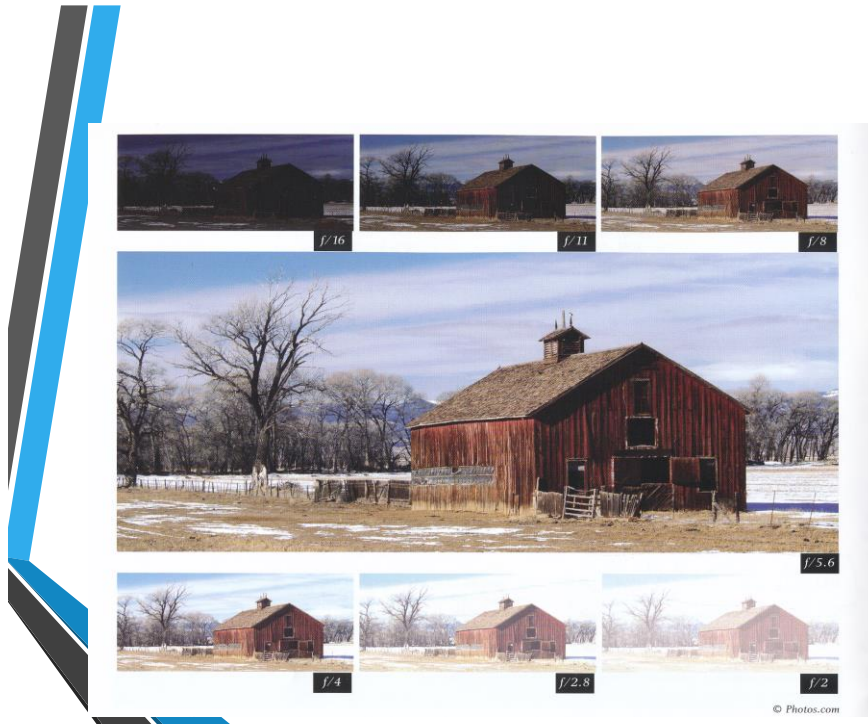
$f/8$



$f/11$

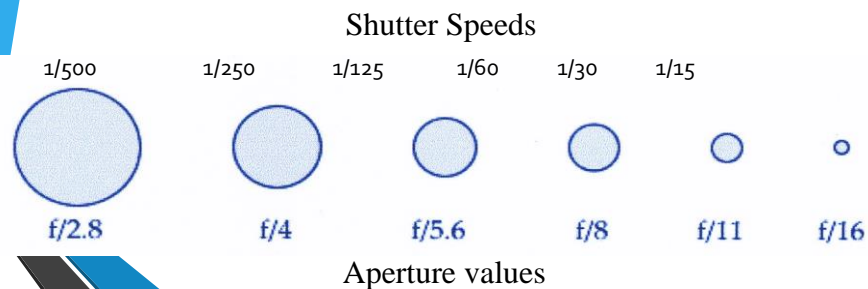


$f/16$



## Putting it all together

- Light entering the camera can be altered by one of two ways by the speed of the shutter and the size of the aperture.
- Shutter and aperture have a reciprocal relationship to each other.
- In the chart below, the following combinations will let the same amt. of light into your camera.





## Maximum aperture of a lens

- The largest size the lens can be opened to (this is the lowest  $f/$  number)
- Zoom lenses can have two maximum apertures ex. 18mm-55mm  $f/3.5-5.6$
- At 18 mm, the maximum aperture is  $f/3.5$ , at 55 mm it is  $f/5.6$ .
- Lenses with a low  $f/$ stop number (large opening) ex.  $f/2.8$  are called fast lenses.



## Advantages and disadvantages of a fast lens

- Can use them in low light situations without a flash or tripod and you can use a fast shutter speed thus making them good for freezing action.
- Disadvantage is the price. They are more expensive than the same focal length lens with a higher maximum aperture
- Faster lenses are heavier than their counterparts.



Lighting	Max. aperture	Rationale
Indoors	f/1.4-f/2.8	If you want to take photos indoors without a flash you need a lens with a real wide max aperture.
Overcast	f/2.8-f/3.5	Overcast days are challenging for sports photographers who need fast shutter speeds to freeze motion.
Shade	f/ 3.5-f/5.6	Shade is not as dim as a cloudy day and you have more leeway when it comes to the maximum aperture.
Daylight	Any	In daylight the max aperture is not that important as you probably won't be using it as it will let in too much light.

## Creative use of aperture

Large apertures f/2.8-f/5.6 have low depth of field and can blur the background to focus the attention on your subject



Small aperture sizes f/11-f/29 have a large depth of field and keep everything in focus from right in front of you to far in the distance

## Creative use of shutter speeds

Fast shutter speeds can stop motion in action



Slow shutter speeds can blur motion creating an artistic expression

## Macro Lenses

- Macro lenses are taking pictures close to your subject.
- They are often used for photographing flowers and insects
- They render images as life size.
- They have a reproduction ratio of 1:1

## Additional lenses you may find handy to have

- Teleconverter or Extenders



1.5x



## Teleconverter or Extenders

- Optical adaptor that attaches between the lens and the camera body. It changes the focal length of your lens and thus magnifies the image.
- They come in different sizes for different magnifications
- 2x teleconverter doubles the size of your image. They come in sizes 1.4x -3x



## Extension Tube

- Optical adapter that changes the focusing distance of your lens.
- It attaches between your camera and lens.
- An extension tube turns your regular lens to a macro lens (for macro photography)
- It allows you to get closer to your subject than you could with just your regular lens.
- They come in different sizes for different effects and can be stacked together.



## Image stabilization

- It is recommended to use a shutter speed no slower than the focal length of the lens for example 200 mm lens should use 1/200 shutter speed or faster to prevent camera shake.
- Image stabilization or vibration reduction lenses stabilize the image and allow you to hand hold the camera at a slower shutter speed without blurring your image.



## Conclusion

- We covered a lot of information in a short time.
- I hope this will help you understand and use your lenses better
- I hope this will help you identify what lenses to use in what circumstances and why
- Happy shooting