

Accessible Computing Seminar

Lecture #6 – Accessible and the Elderly

Figure 1: Age Group by Sex, Iowa, 1970

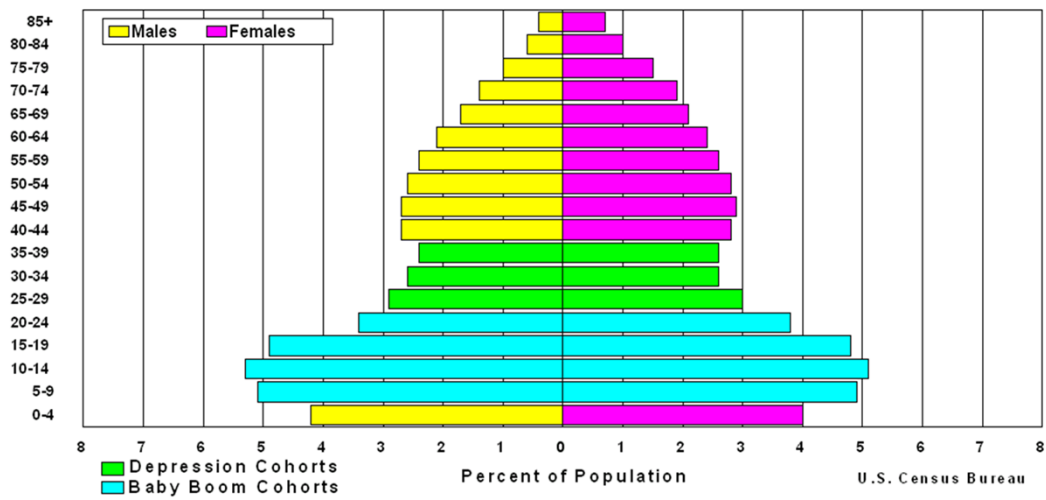


Figure 2: Age Group by Sex, Iowa, 2010

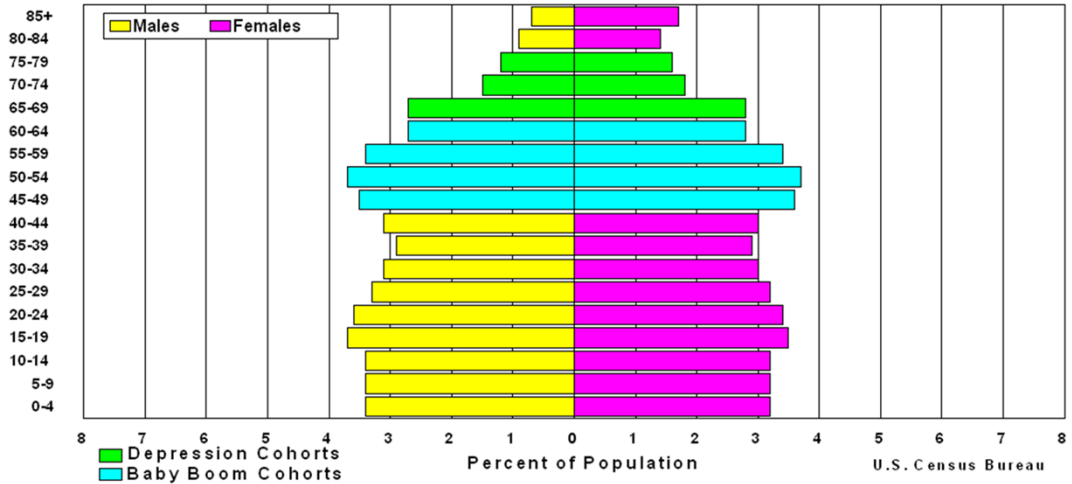
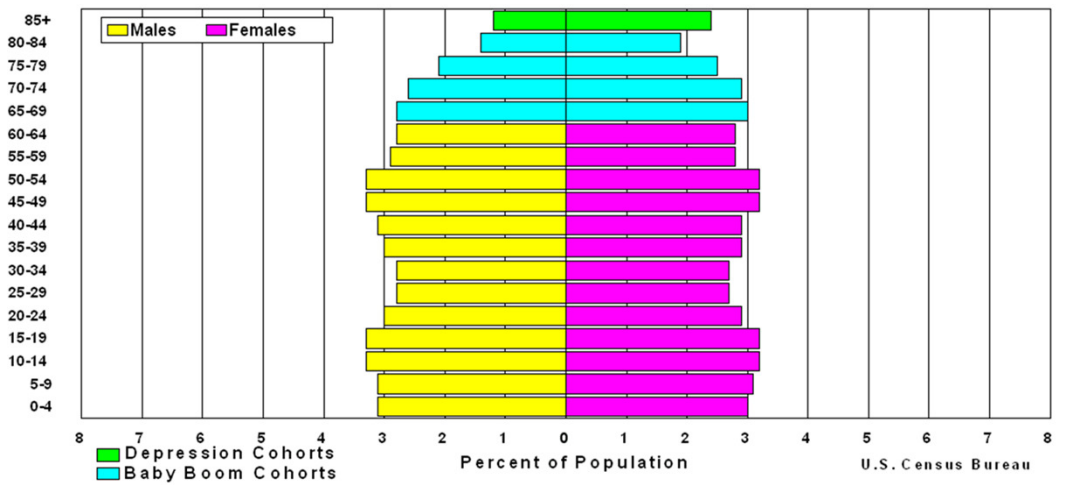
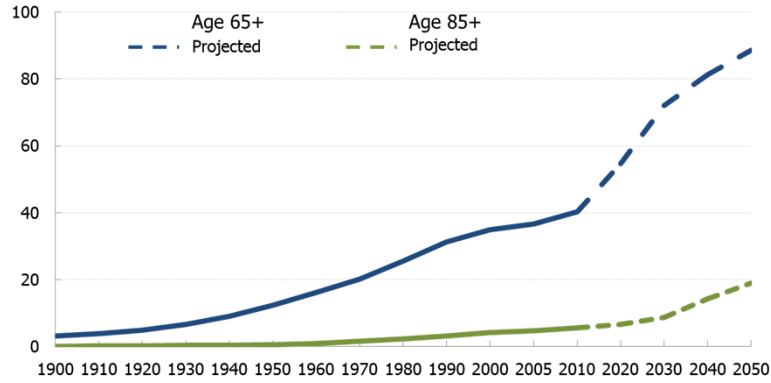


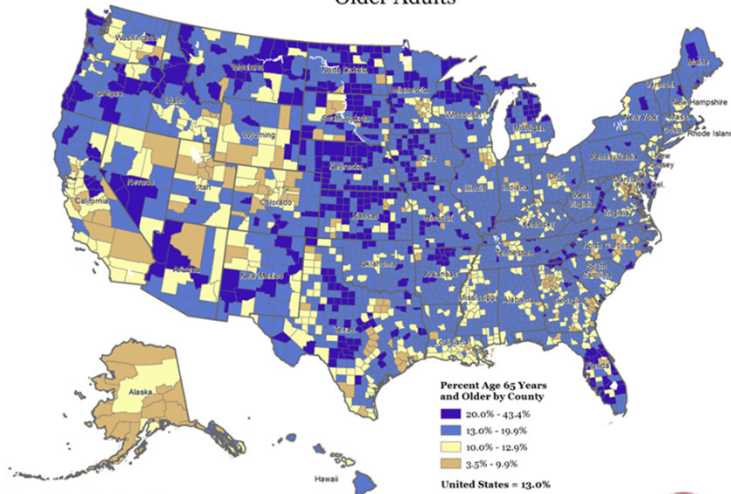
Figure 3: Age Group by Sex, Iowa, 2030, Projected



Adults Aged 65+ Years 1900—2010 with Projections to 2050



Older Adults



Source: U.S. Census Bureau, Census 2010, 2010 Census Summary File 1.
Note: Alaska and Hawaii not shown to scale.



Myths about Aging

- All older adults have or eventually develop dementia
- Most older adults live in nursing homes
- After retirement, older adults don't do anything
- Everyone over 65 is depressed



Two 25-year-olds will be more alike than two 75-year-olds!

Diversity within the Aging Population



*The group of persons labeled "older adults" is very diverse
--Increasing number of men, individuals with disabilities, and language and cultural diversity*

Age span: 60-100+
Cohort/generation
(e.g., Baby Boomers 1946-1964)
Sexual orientation

Resources
Functional ability
Technology, social media
Motivation/preferences

Overlapping Needs: People who are Elderly and People with Disabilities

- Many older people have age-related impairments that can affect how they use the web, such as declining:
- **Vision** — including reduced contrast sensitivity, color perception, and near-focus, making it difficult to read web pages
- **Physical Ability** — including reduced dexterity and fine motor control, making it difficult to use a mouse and click small targets

Overlapping Needs: People who are Elderly and People with Disabilities

- Many older people have age-related impairments that can affect how they use the web, such as declining:
- **Hearing** — including difficulty hearing higher-pitched sounds and separating sounds, making it difficult to hear podcasts and other audio, especially when there is background music
- **Cognitive Ability** — including reduced short-term memory, difficulty concentrating, and being easily distracted, making it difficult to follow navigation and complete online tasks

Ageing and Hearing Loss

- Impact of hearing loss:
 - Audio can be difficult to discern
 - Background sounds can be difficult to filter out
 - Higher pitch sounds can be missed
- Prevalence of hearing loss:
 - 47% of people 61 to 80 years experience some hearing loss
 - 93% of people 81+ years experience some hearing loss

Ageing and Hearing Loss

- Hearing starts to decline at around 50 years.
- It affects a person's ability to hear higher pitched sounds as well as discern the foreground from background audio such as music or other sounds.
- Some hearing loss is experienced by 47% of people 61 to 80 years and 93% of people over 81 years.
- Moderate or severe hearing loss or profound deafness is experienced by 20% of people aged 61 - 80 and 75% of people over 80.

Ageing and Vision Decline

- Impact of vision decline:
 - Decreasing ability to focus on near tasks
 - Changing color perception and sensitivity
 - Decreasing contrast sensitivity
- Prevalence of significant vision loss:
 - 16% of people 65 - 74 years
 - 19% of people 75 - 84 years
 - 46% of people 85+ years

Ageing and Vision Decline

- Vision decline includes:
 - Decreasing ability to focus on near tasks, including a computer screen
 - Changing color perception and sensitivity - less violet light is registered, making it easier to see reds and yellows than blues and greens, and often making dark blue and black indistinguishable
 - Decreasing contrast sensitivity from pupil shrinkage - resulting in the need for more light and higher contrast (an 80 year old typically has 80% less contrast sensitivity than a 20 year old)

Ageing and Vision Decline

- Vision decline often starts in a person's mid-40s.
- 86% of Australians over 40 require reading glasses to correct for near vision.
- Significant vision loss (that can't be corrected) affecting everyday life is estimated to affect 16% of people 65 to 74 years, and 46% of those over 85 years in the UK.

Ageing and Physical Decline

- Impact of physical decline:
 - Motor skill decline can result from many conditions including arthritis, essential tremor, and Parkinson's Disease:
 - Difficulty using mouse or keyboard
 - Difficulty with clicking small targets
 - Strain from non-ergonomic tasks
- Prevalence of physical decline:
 - Conditions most commonly reported:
 - Arthritis affects at least 50% of people over 65
 - Essential tremor affects up to 20% of people over 65
 - Parkinson's Disease affects approximately 4% of people over 85

Ageing and Physical Decline

- Motor skill decline impacts on dexterity and can result from many conditions,
 - For example arthritis with associated joint stiffening and reduced fine motor control, and essential tremor or Parkinson's Disease with associated hand trembling, making mouse use difficult or impossible for some and also affecting keyboard use.
- In particular, older people with physical impairments may have difficulty clicking small links, selecting radio buttons, and using many fly-out or pull-down menus.

Ageing and Physical Decline

- Arthritis is estimated to affect at least 50% of people over 65:
 - Essential tremor (one of many forms of tremor) is estimated to affect up to 5% of those over 40 and up to 20% of people over 65;
 - Parkinson's affects around 4% of those over 85.

Ageing and Physical Decline

- Motor skill decline impacts on dexterity and can result from many conditions:
 - For example arthritis with associated joint stiffening and reduced fine motor control and essential tremor or Parkinson's Disease with associated hand trembling, making mouse use difficult or impossible for some and also affecting keyboard use.
 - In particular, older people with physical impairments may have difficulty clicking small links, selecting radio buttons, and using many fly-out or pull-down menus.

Ageing and Cognitive Decline

- Impact of cognitive decline:
 - Navigation, comprehension, and task completion can be affected by:
 - Short term memory limitations
 - Difficulty with concentration
 - Distraction from movement or irrelevant material
 - Difficulty coping with information overload
- Prevalence of cognitive decline:
 - Conditions most commonly reported:
 - Dementia (UK):
 - 1.4% of people 65–69 years
 - 24% of people 85+ years

Ageing and Cognitive Decline

- Mild cognitive impairment (MCI) is more common:
 - Around 20% of people over 70 years are estimated to experience MCI
- Cognitive decline is also common, though only dementia and mild cognitive impairment are commonly reported.
- While Dementia (including Alzheimer's disease) is experienced by some older people (1.4% of people 65–69 years increasing to 24% of people over 85 years in the UK), forms of mild cognitive impairment (or MCI) are much more common, affecting over 20% of those over 70 years.

Ageing and Cognitive Decline

- MCI can result in:
 - Short term memory limitations (which may result in a person forgetting the purpose of a website visit if they lose orientation on the site)
 - Concentration and distraction issues (consider the volume of information on some pages, and the multiple animated advertisements that are sometimes present)

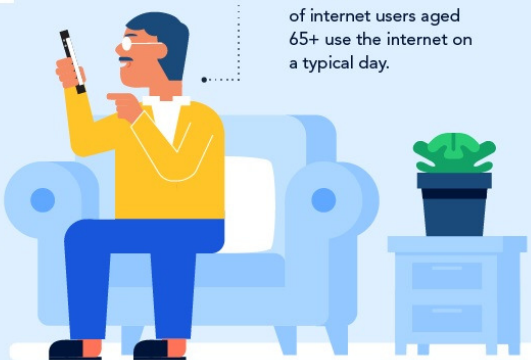


THE ELDERLY & THE WORLD WIDE WEB

The internet is no longer the exclusive domain of younger people. Over the past years, more and more elderly people have started venturing online. They have lower rates of technology adoption than the general public, but this group is more digitally connected than ever. **Studies show that educated seniors with higher incomes tend to use the internet at higher rates.**

ELDERLY PEOPLE ON THE INTERNET: OVERVIEW

USAGE



Baby Boomers spend **27 HOURS** per week online.

82% of boomers/seniors use search engines to gather information on topics of interest.

70% of internet users aged 65+ use the internet on a typical day.

WHY DO THE ELDERLY USE INTERNET?



78%

The internet allows to easily access information on personal interests.



60%

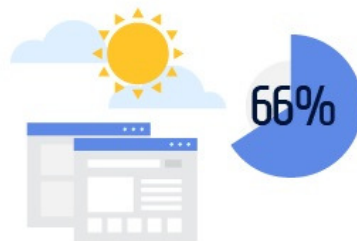
The internet keeps you up-to-date on political and policy issues.



33%

The internet is most trusted source for news & information.

TYPES OF INFORMATION ACCESSED ONLINE



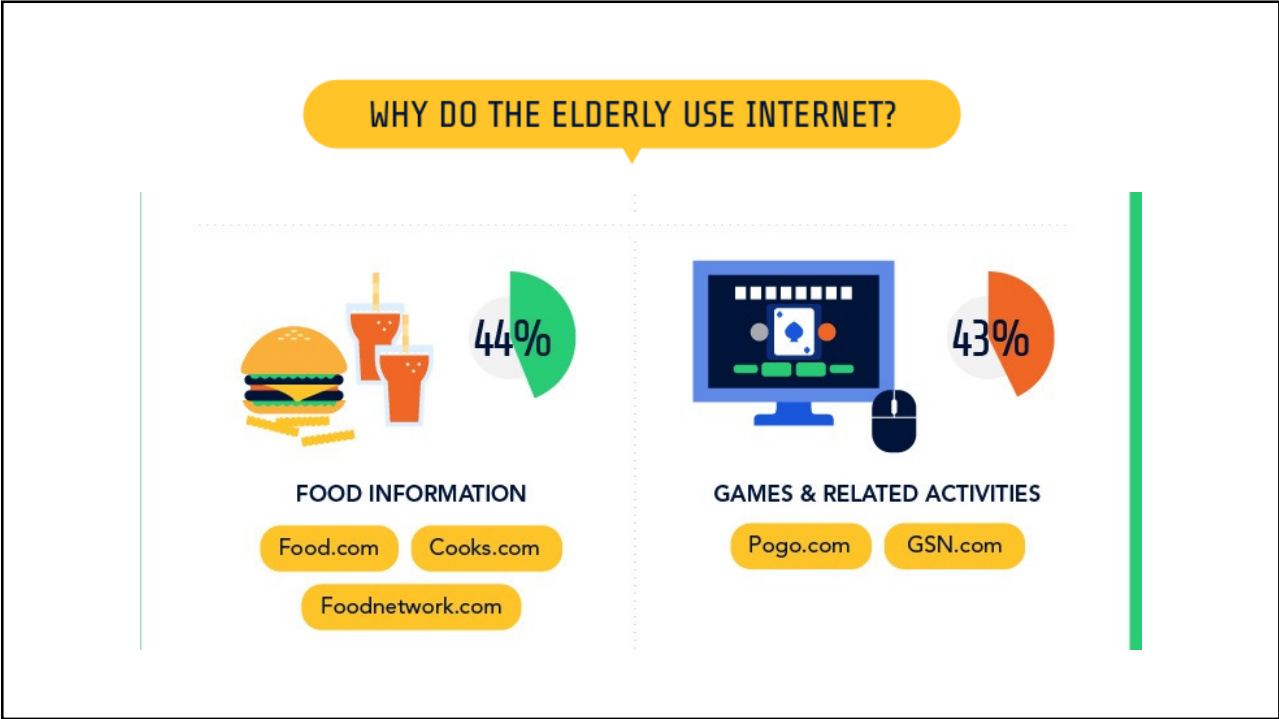
NEWS & WEATHER

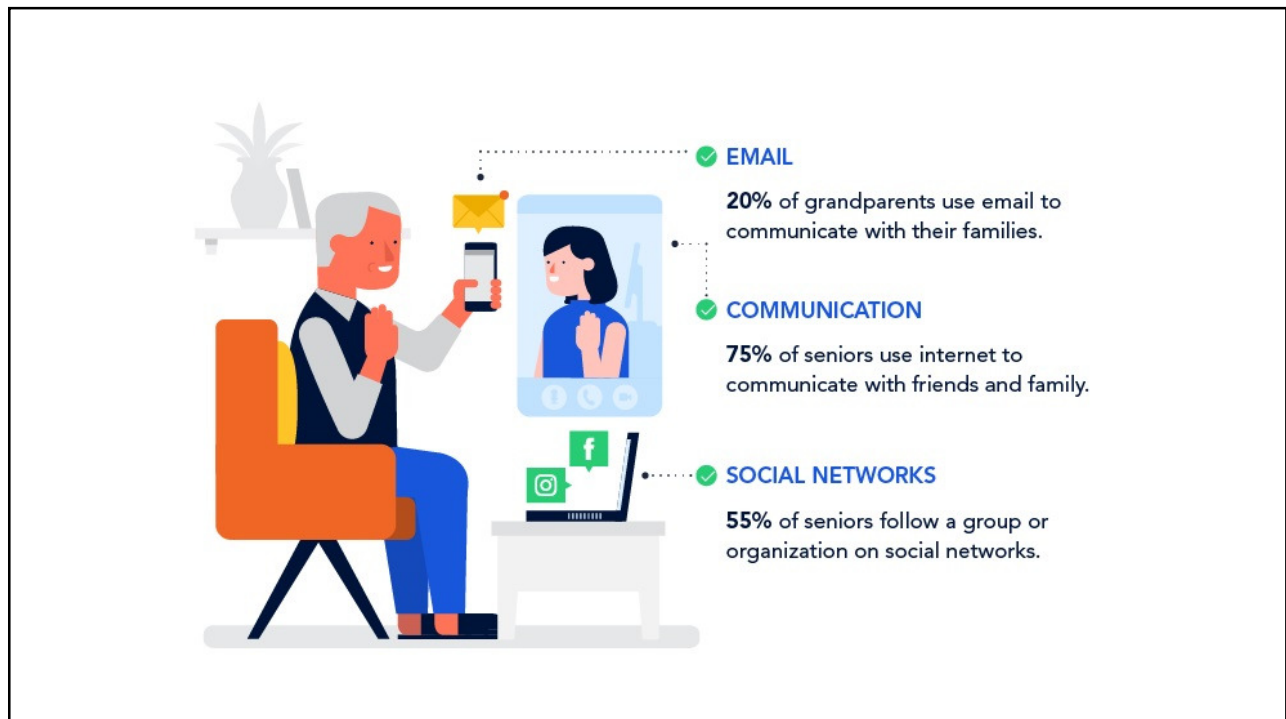
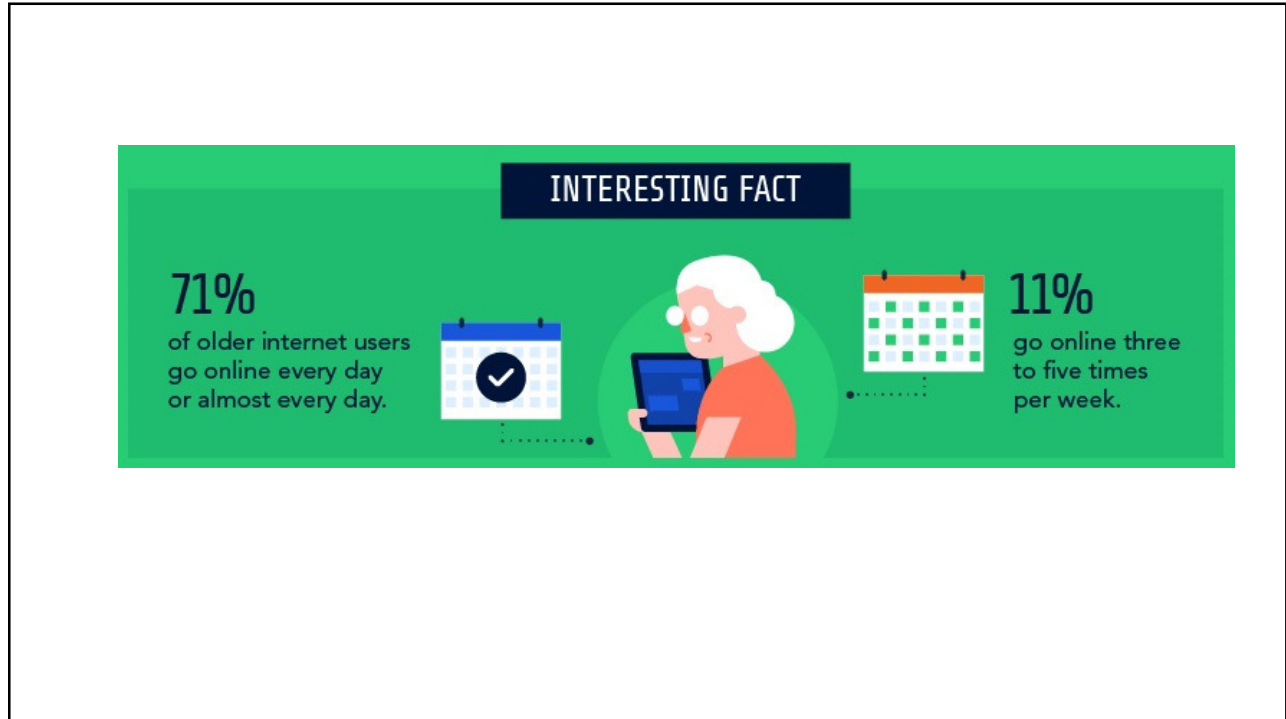
- Foxnews.com
- Weather.com
- Bloomberg.com

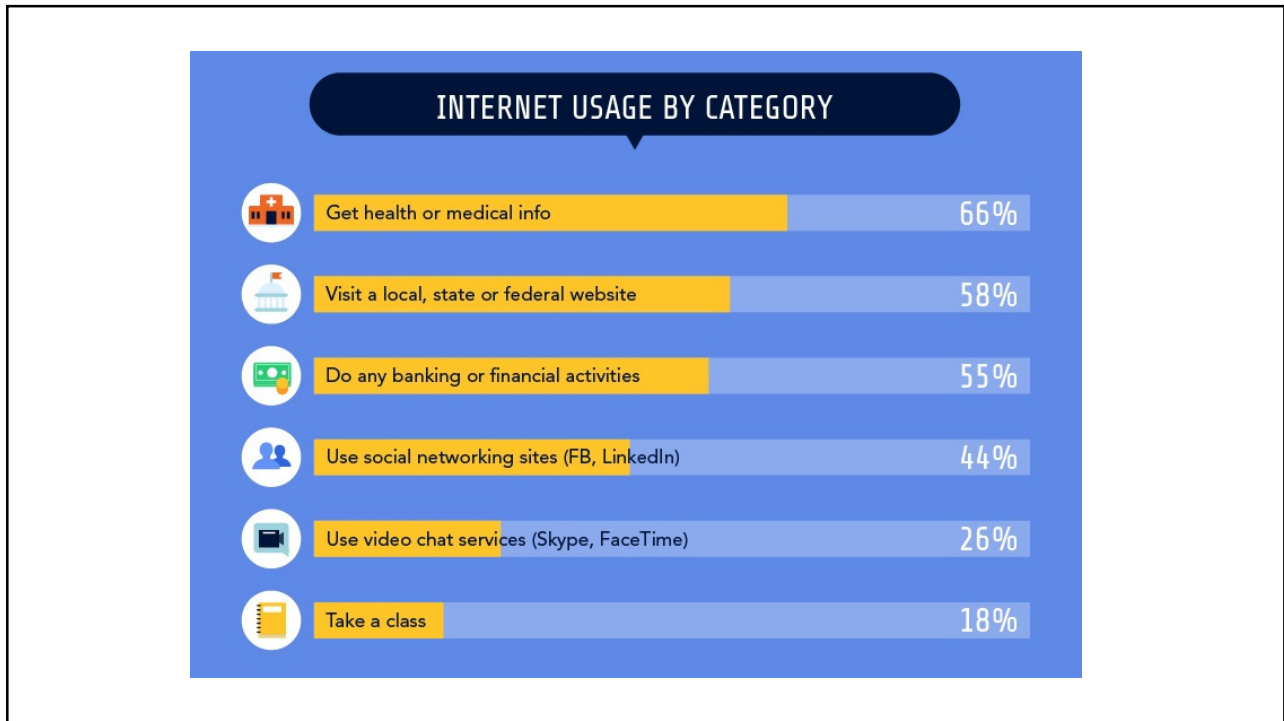


SHOPPING

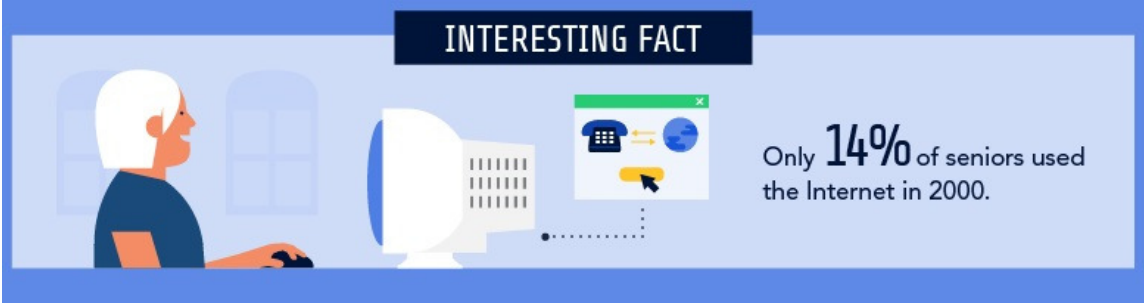
- Merchantcircle.com
- Overstock.com



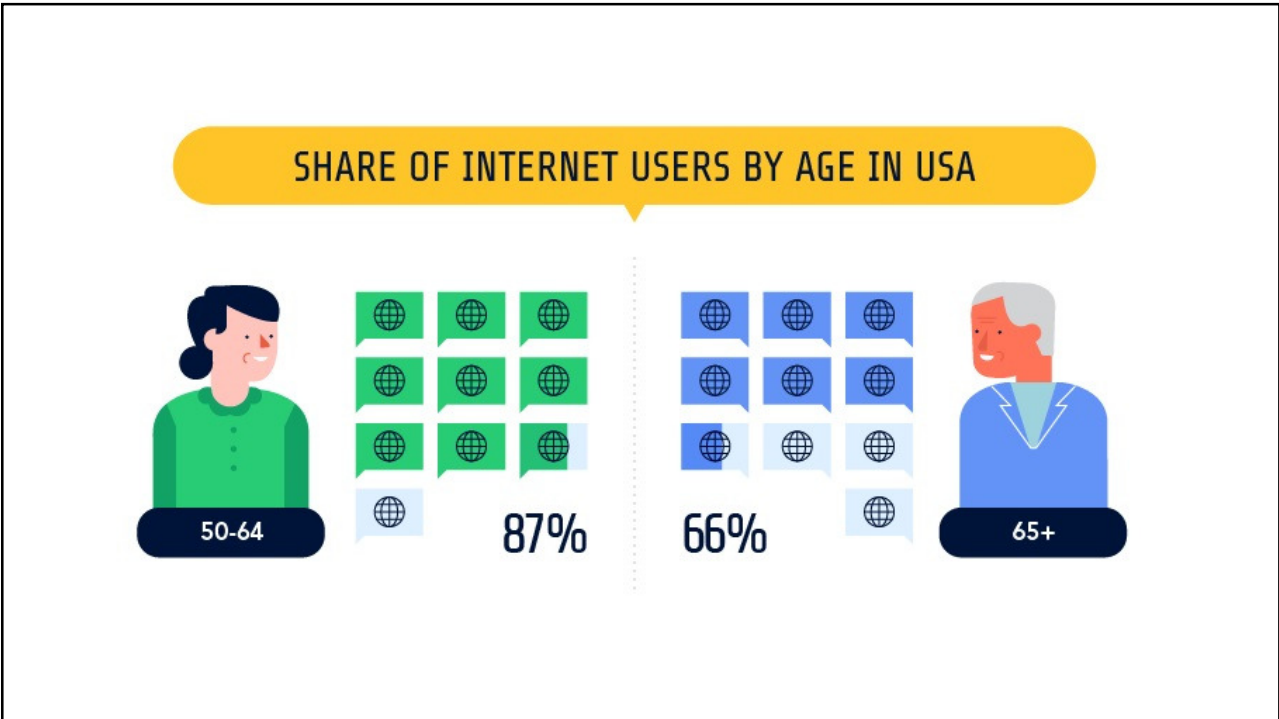


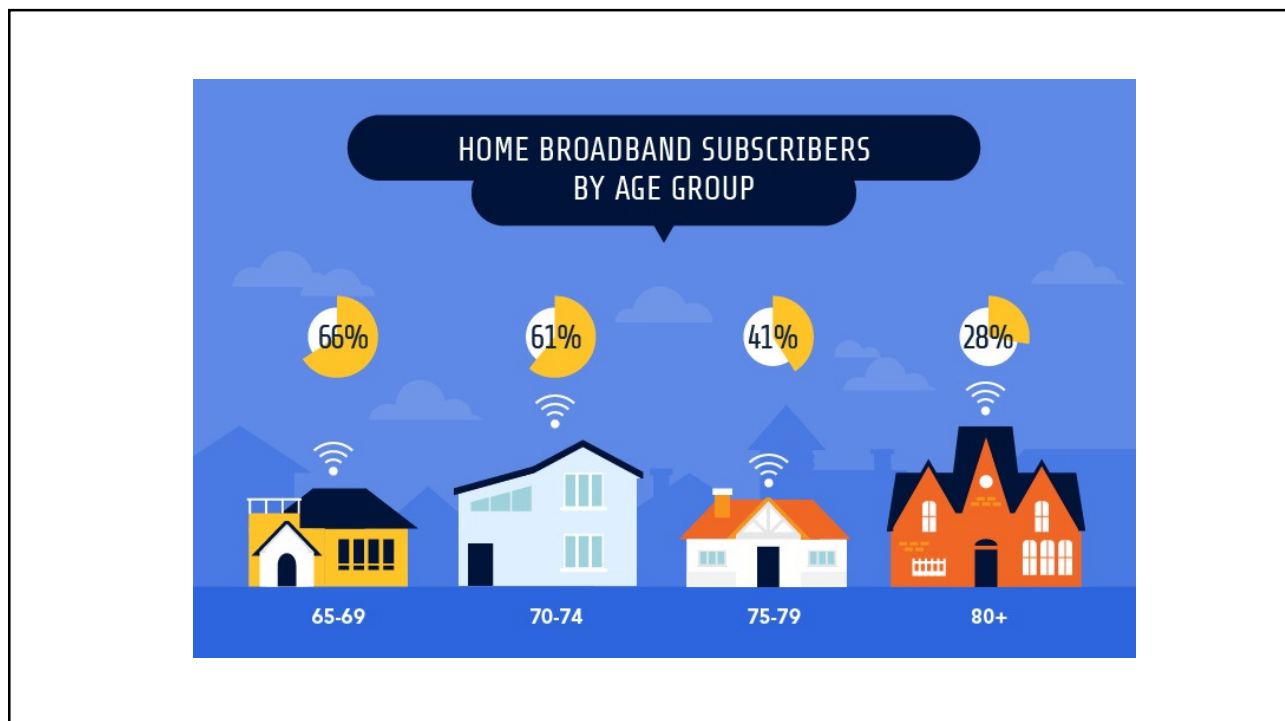
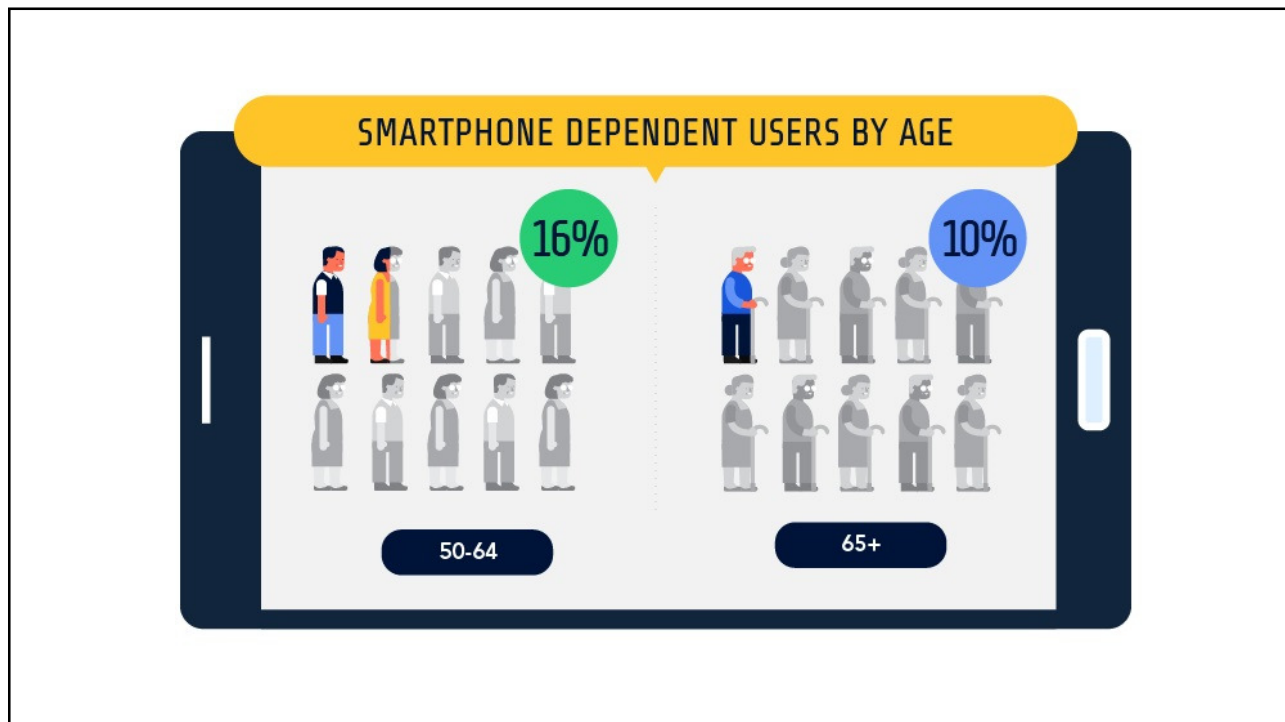


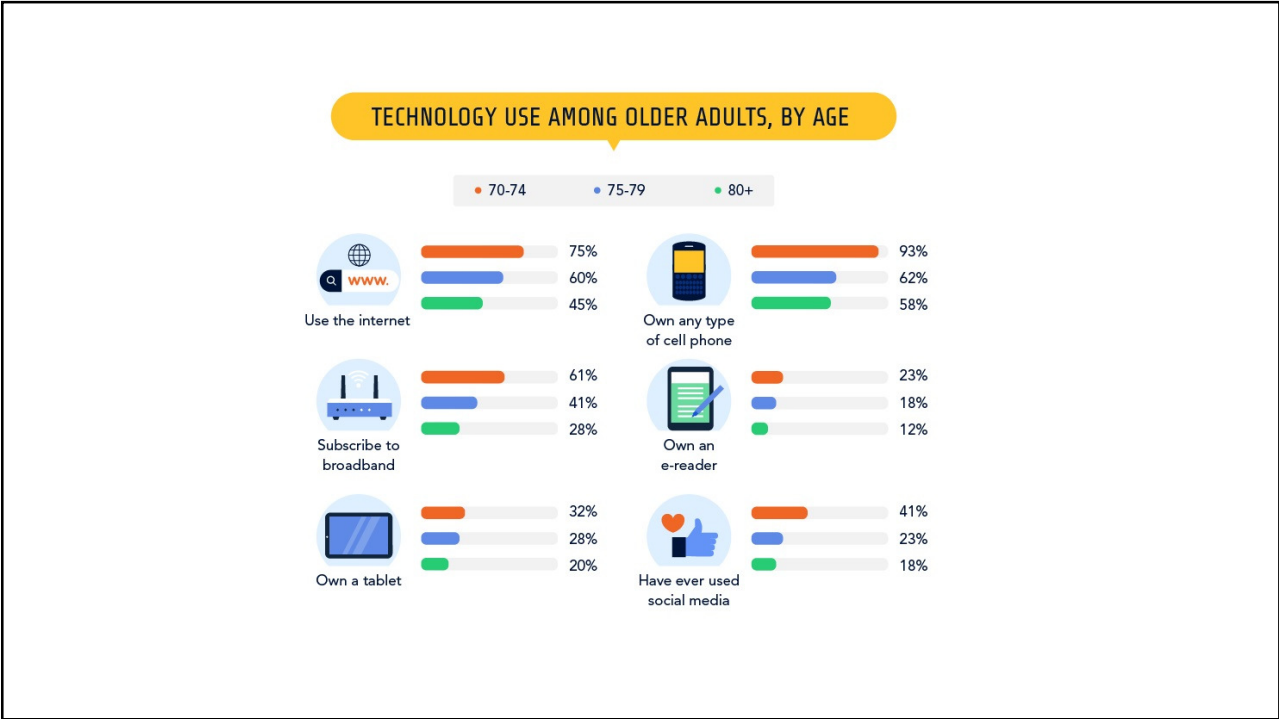
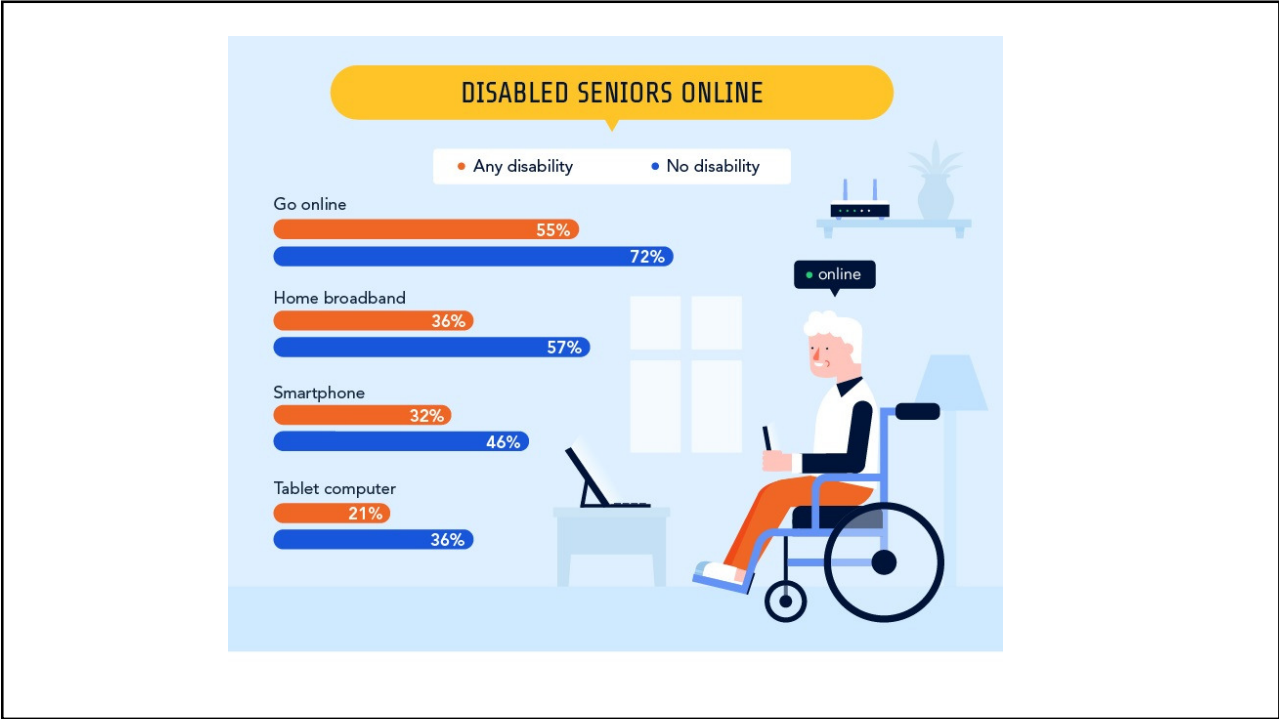
INTERESTING FACT




Only **14%** of seniors used the Internet in 2000.









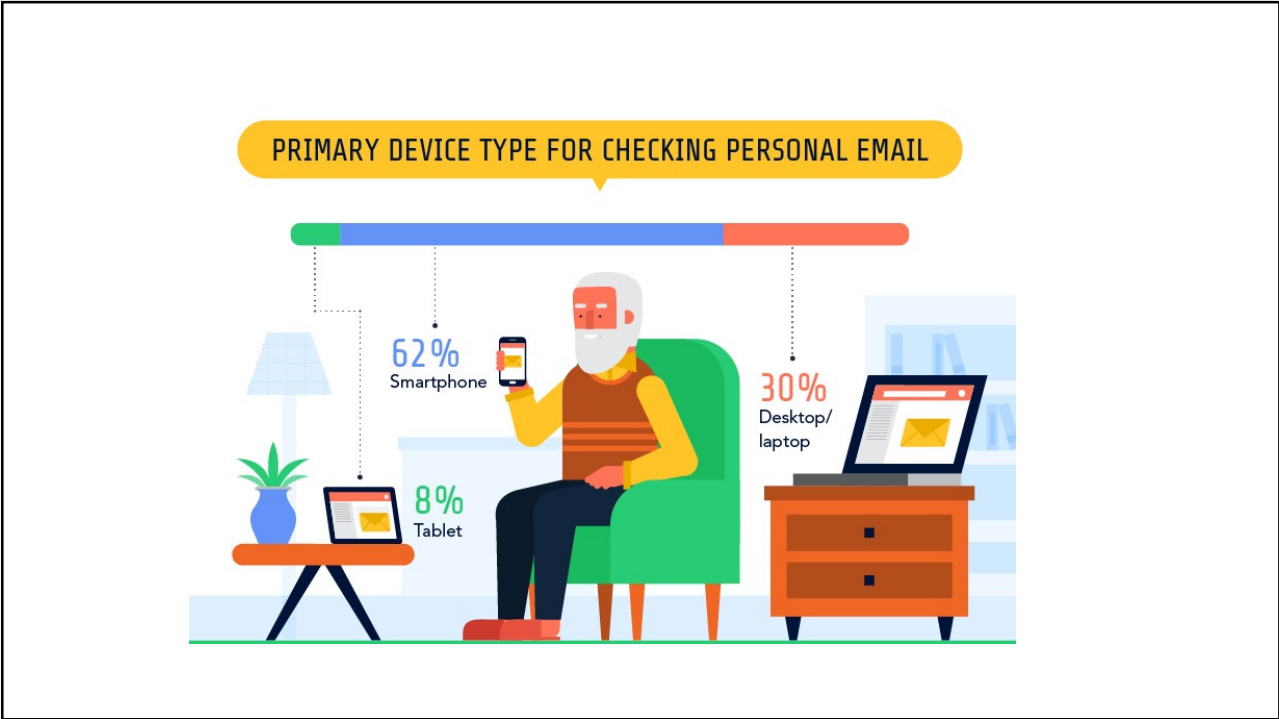
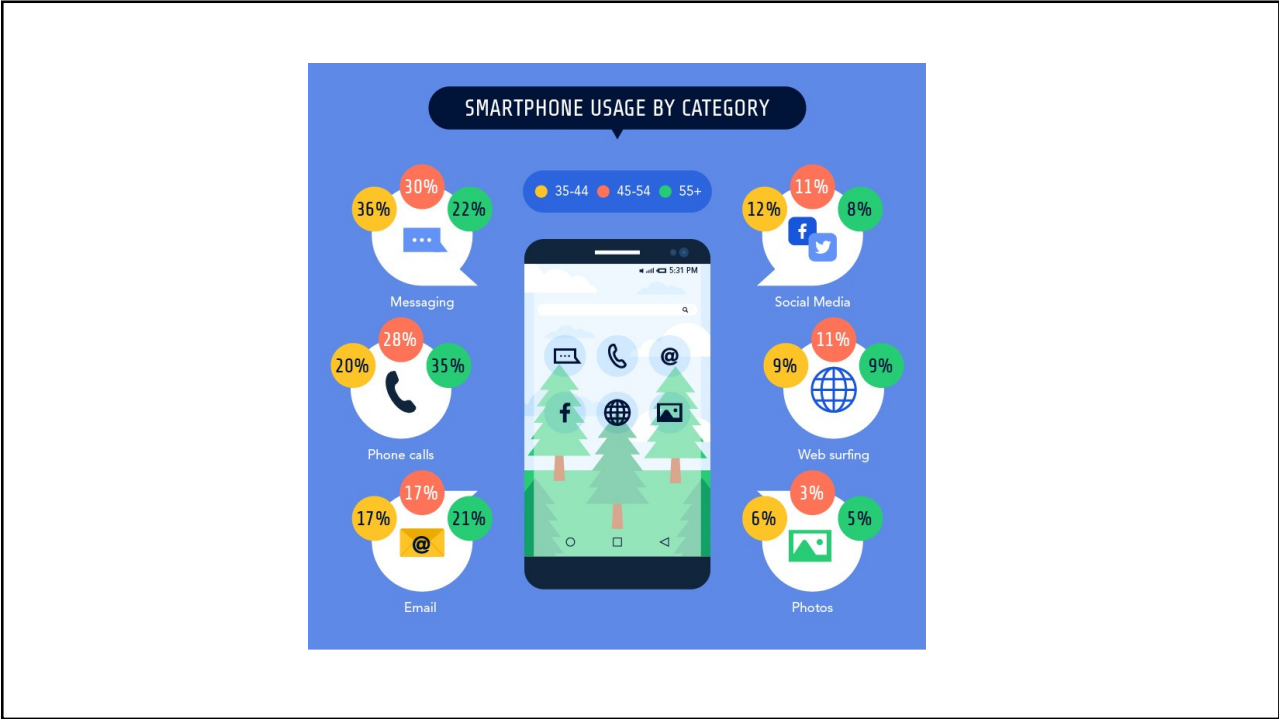


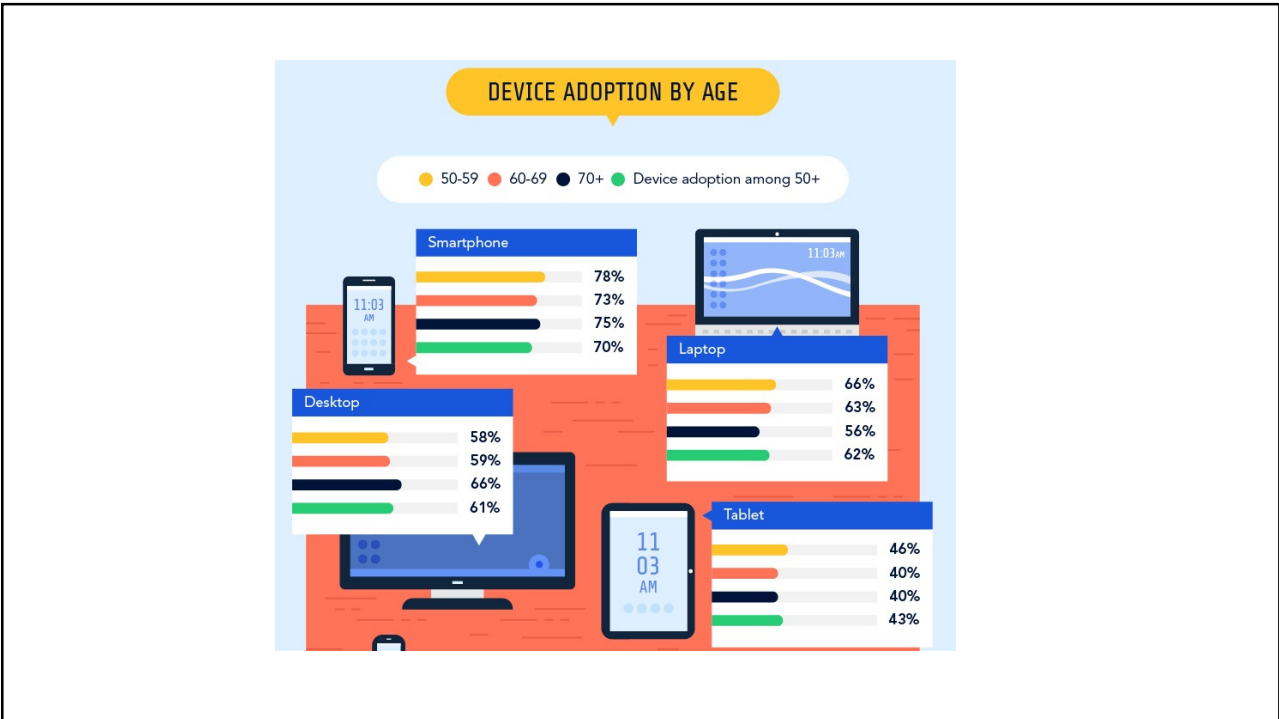
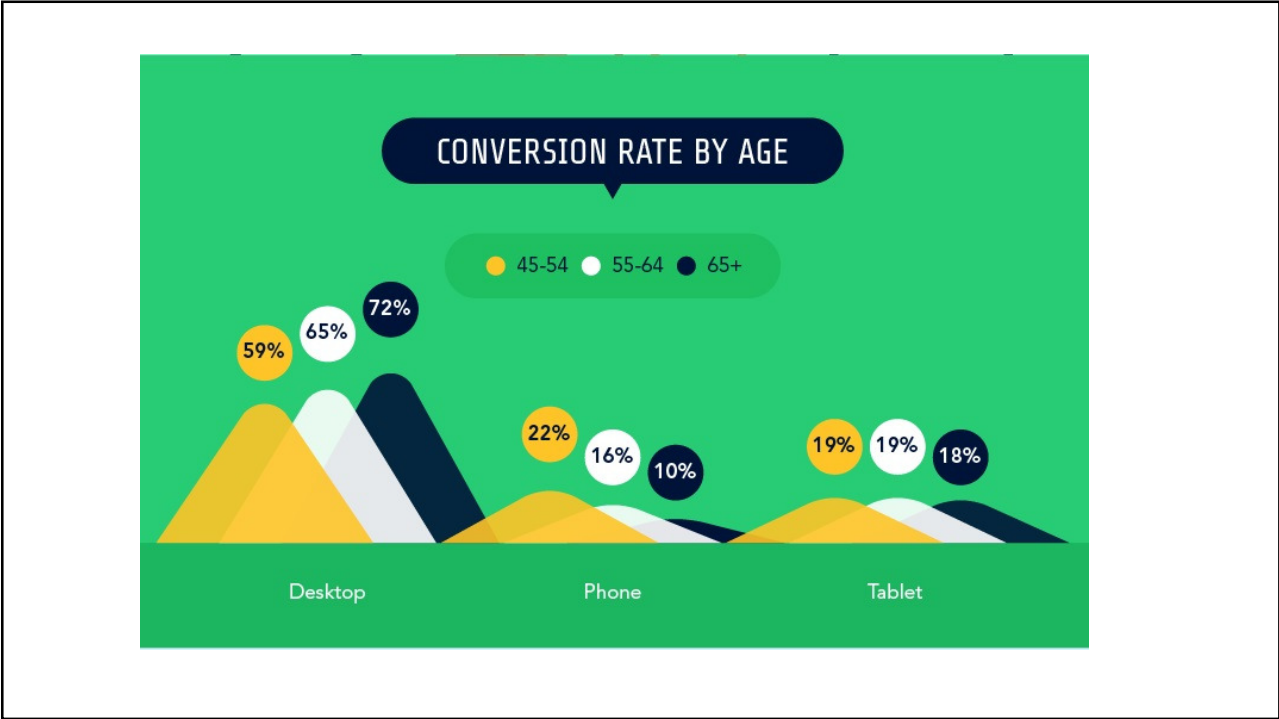
INTERESTING FACT

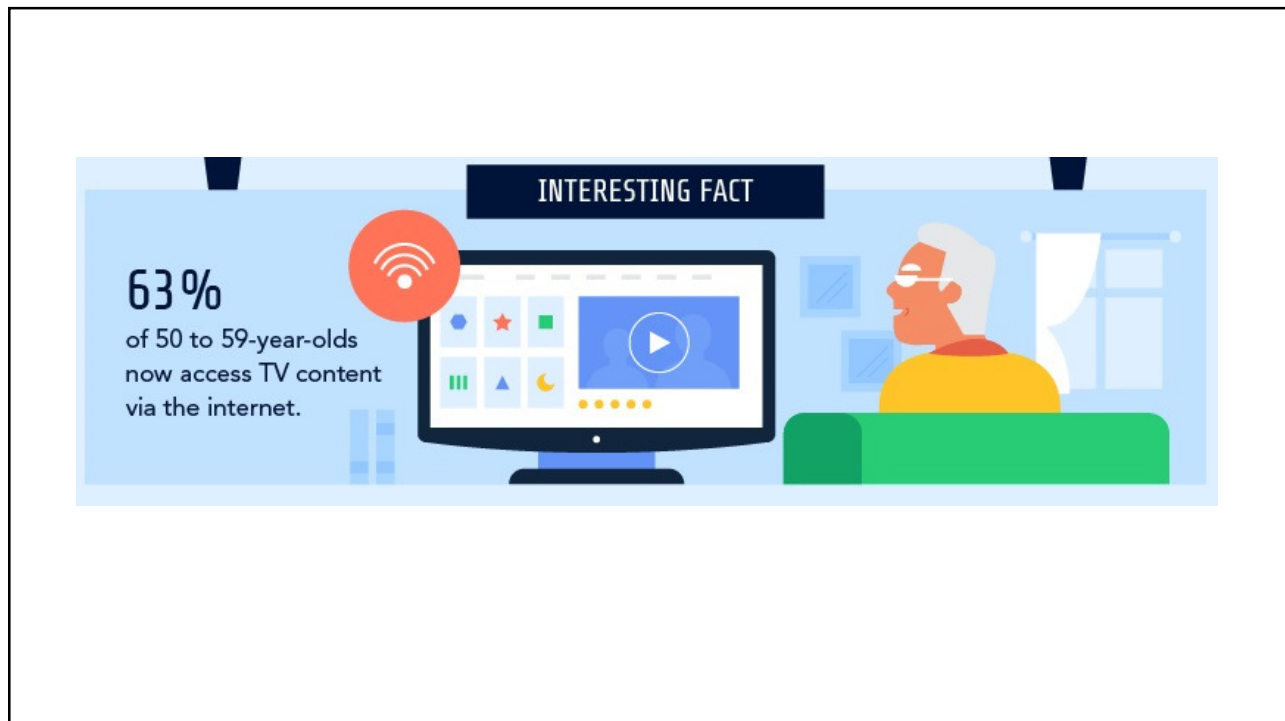
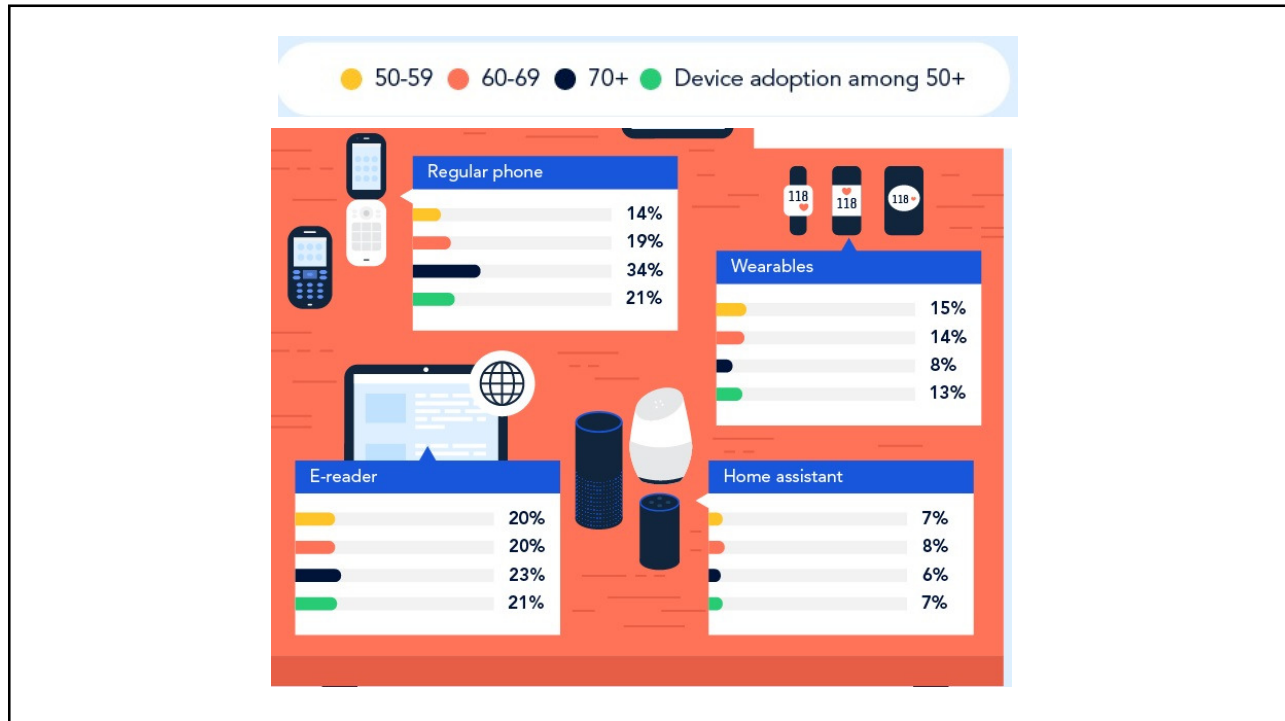
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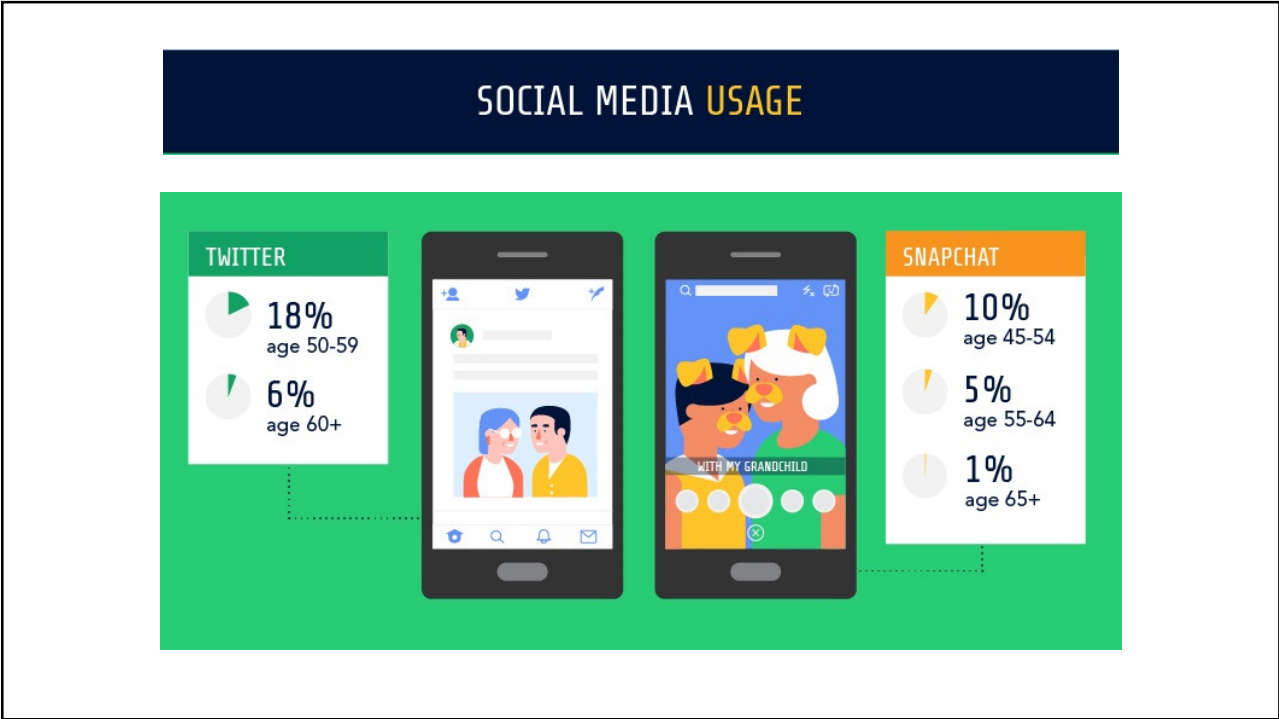
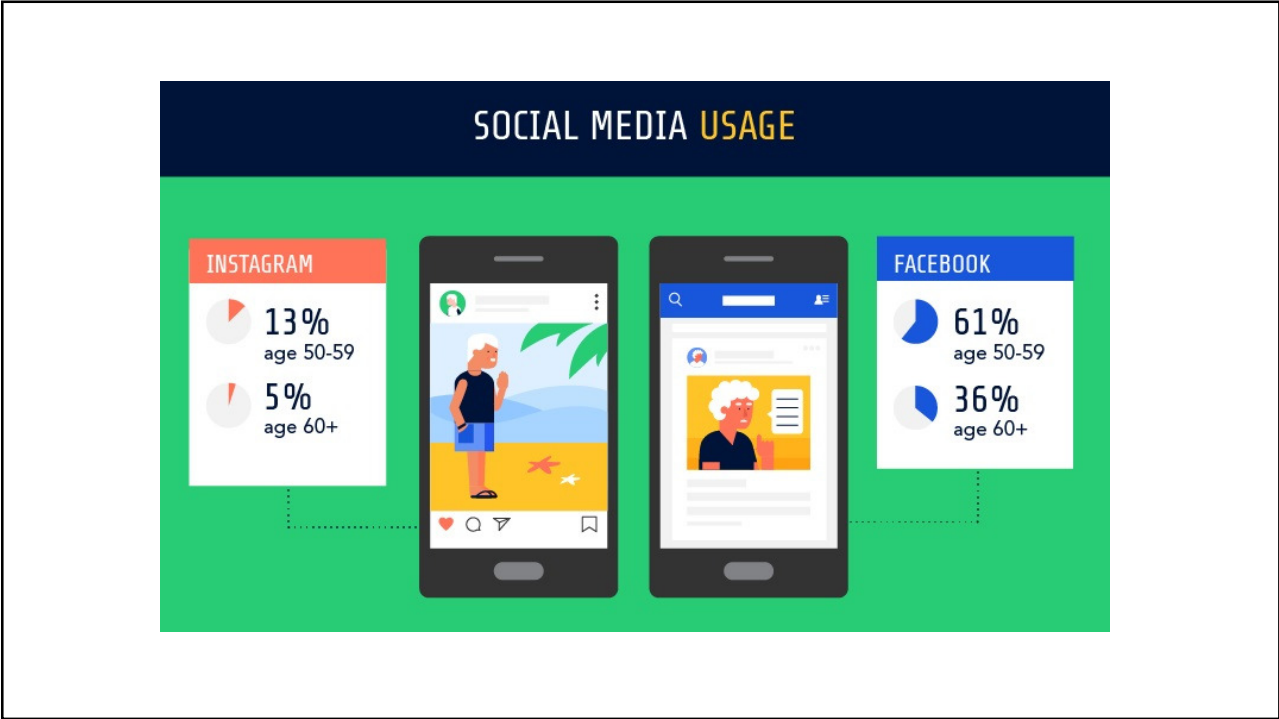
22% of disabled adults in the UK have never used the internet.

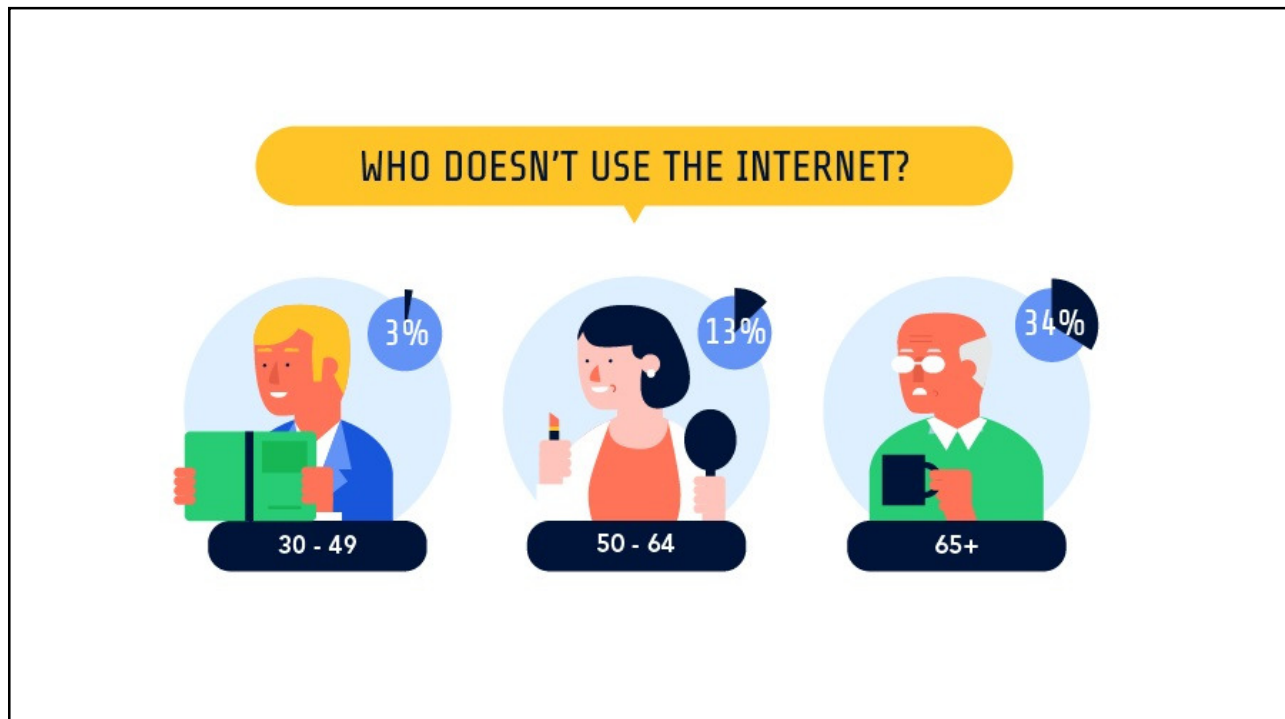
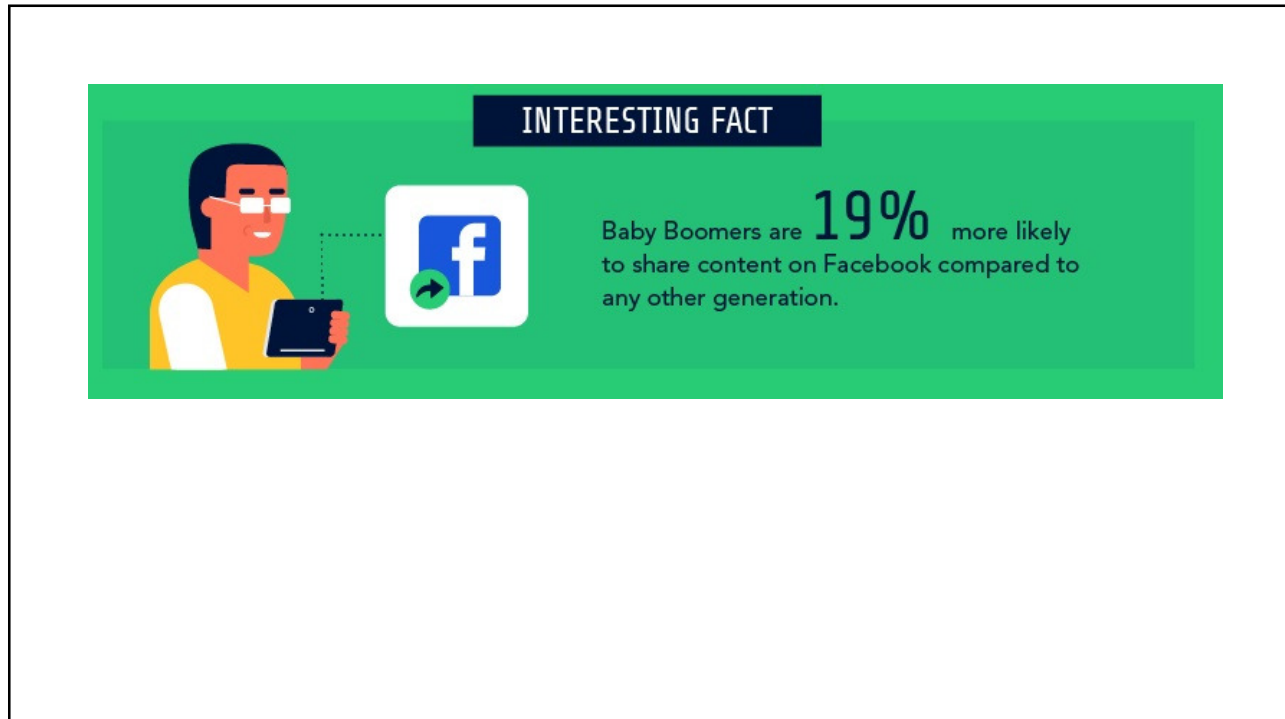












REASON FOR NOT USING THE INTERNET

PHYSICAL CHALLENGES TO USING TECHNOLOGY

Around **2 in 5** seniors have a "physical or health condition that prevents them from fully participating in many common daily activities".



REASON FOR NOT USING THE INTERNET

SKEPTICAL ATTITUDES ABOUT THE BENEFITS OF TECHNOLOGY

22% of older non-internet users disagree that they are missing out on important information.



REASON FOR NOT USING THE INTERNET

DIFFICULTIES LEARNING TO USE NEW TECHNOLOGIES

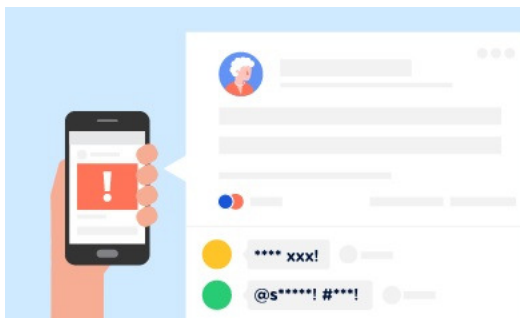
77% of older internet users need someone to help walk them through the process.



REASON FOR NOT USING THE INTERNET

ONLINE HARASSMENT

22% of Americans aged 50 and older have personally experienced some form of online harassment.



Images and Attitudes

- Most older adults have never heard of the term “assistive technology”
- Perception of technology is usually computers, email, and internet
- Some have used adaptive aids (e.g. magnifiers, big button phone) but have never known them as assistive technology
- May perceive a stigma attached to using AT

A Relevant Analogy

Assistive Technology is to Enhancing Work
Performance

~AS~

Anti-Wrinkle Cream is to Enhancing Your Looks

Examples of AT Interventions

Product: Ott-Lite®



Target: Eye Strain and Fatigue

Features: Almost completely glare-free. An artificial light source resembling natural sunlight

Great for: Accessing computer screen, read fine print or thread needles

Examples of AT Interventions



Product: Big Button Phone

Target: Eye Strain and Fine Motor difficulties

Features: Big buttons, volume control, flash ringer, speed dialing

Examples of AT Interventions



Product: Door Knob Helper

Features: Provides better gripping and pushing power and fits over standard door knobs

Examples of AT Interventions



- Product: Large Keyboard Labels

Key to Successful AT Use

- Understanding universality of AT
- Choosing and Getting to Know AT that fits your needs
- Information Resources and Recommendations on AT

Web & Print Accommodations

- **Typeface:** use sans serif type such as Arial, Helvetica, etc...not condensed, **novelty** or **display** typefaces
- Use **14 point** size for text when possible
- Use upper & lowercase for text body; caps & italics for headlines; underline links only

Web & Print Accommodations

- Double space all body text
- *Left* justification is best for older adults
(*Don't* full or center justify)
- Colors: avoid yellow, blue, green in proximity – hard to discriminate
- Use dark letters on light background or white letters on dark. No patterns!