MOTION PICTURES EXPERT GROUP(MPEG) 1-2-3-4

Presented By:

REETA

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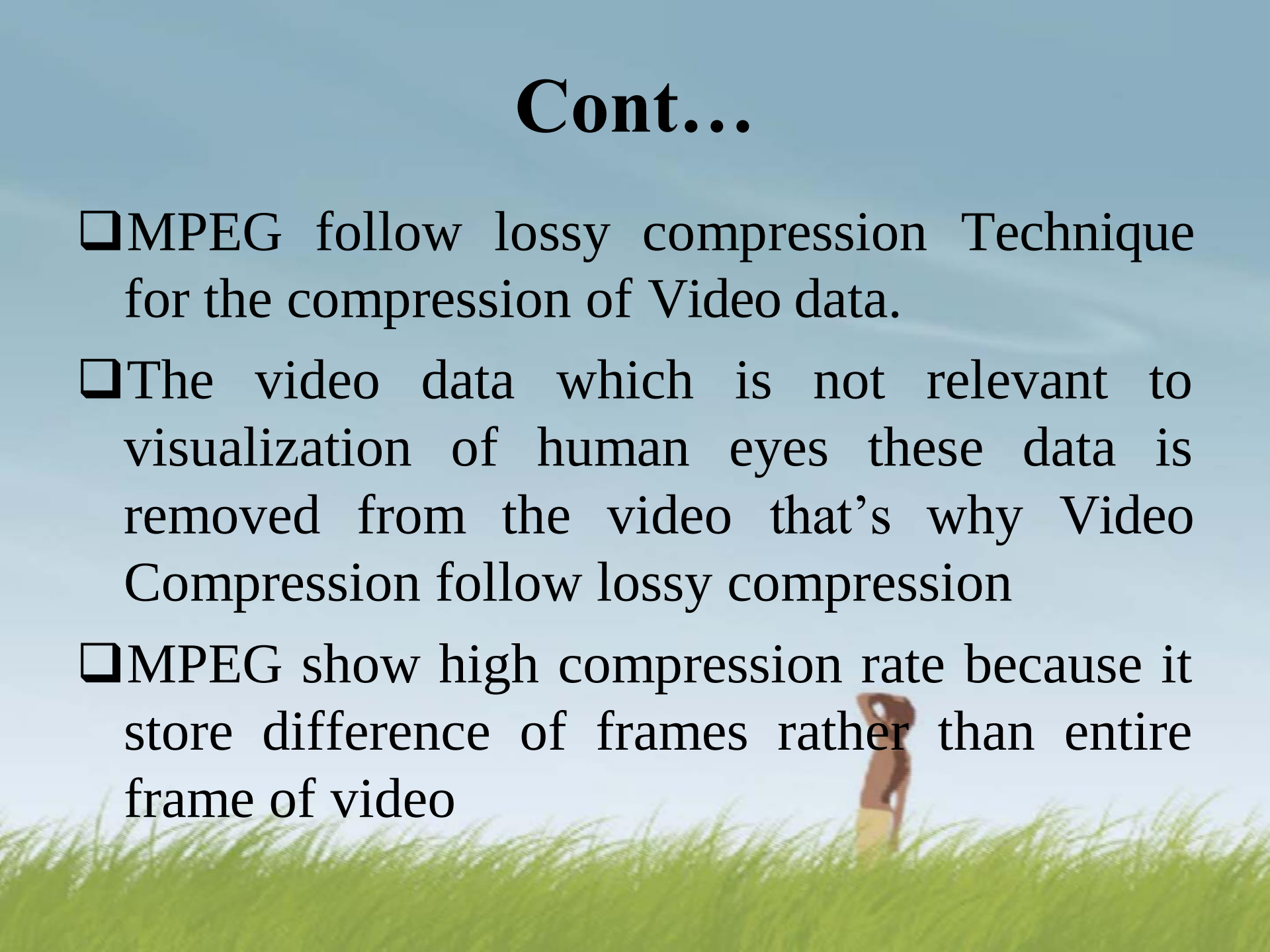
What is MPEG?

- MPEG stands for Motion Pictures Expert Group
- It is ISO standard for Video and Audio
- MPEG standard also support online Audio and Video
- MPEG also refer the family of Digital Video Compression standard and file formats of this group
- MPEG algorithm show better compression so video data can be eaisly communicated throgh on line channel and easily decompressed at receiver site.

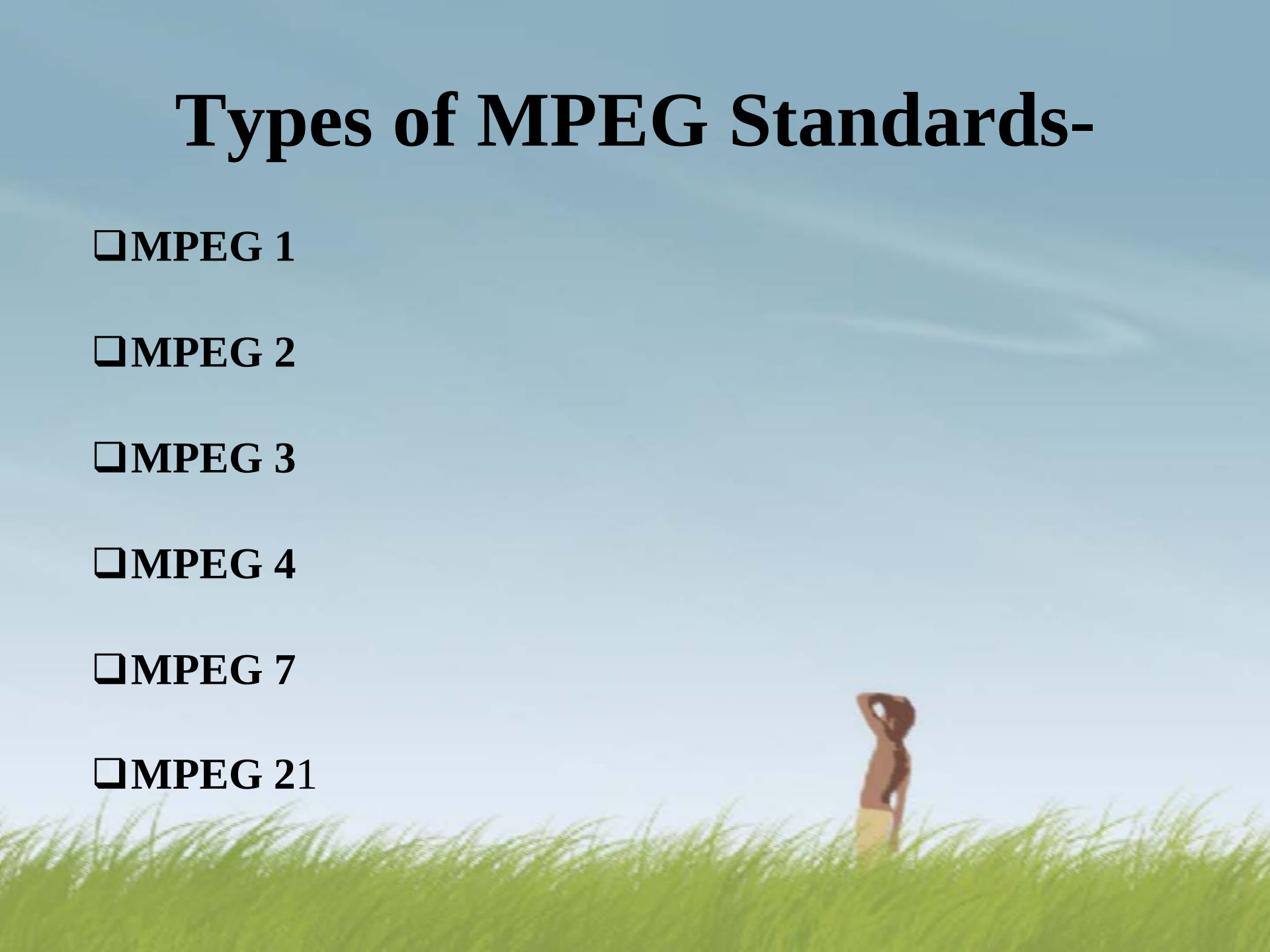
Cont…

- MPEG follow lossy compression Technique for the compression of Video data.
- The video data which is not relevant to visualization of human eyes these data is removed from the video that's why Video Compression follow lossy compression
- MPEG show high compression rate because it store difference of frames rather than entire frame of video

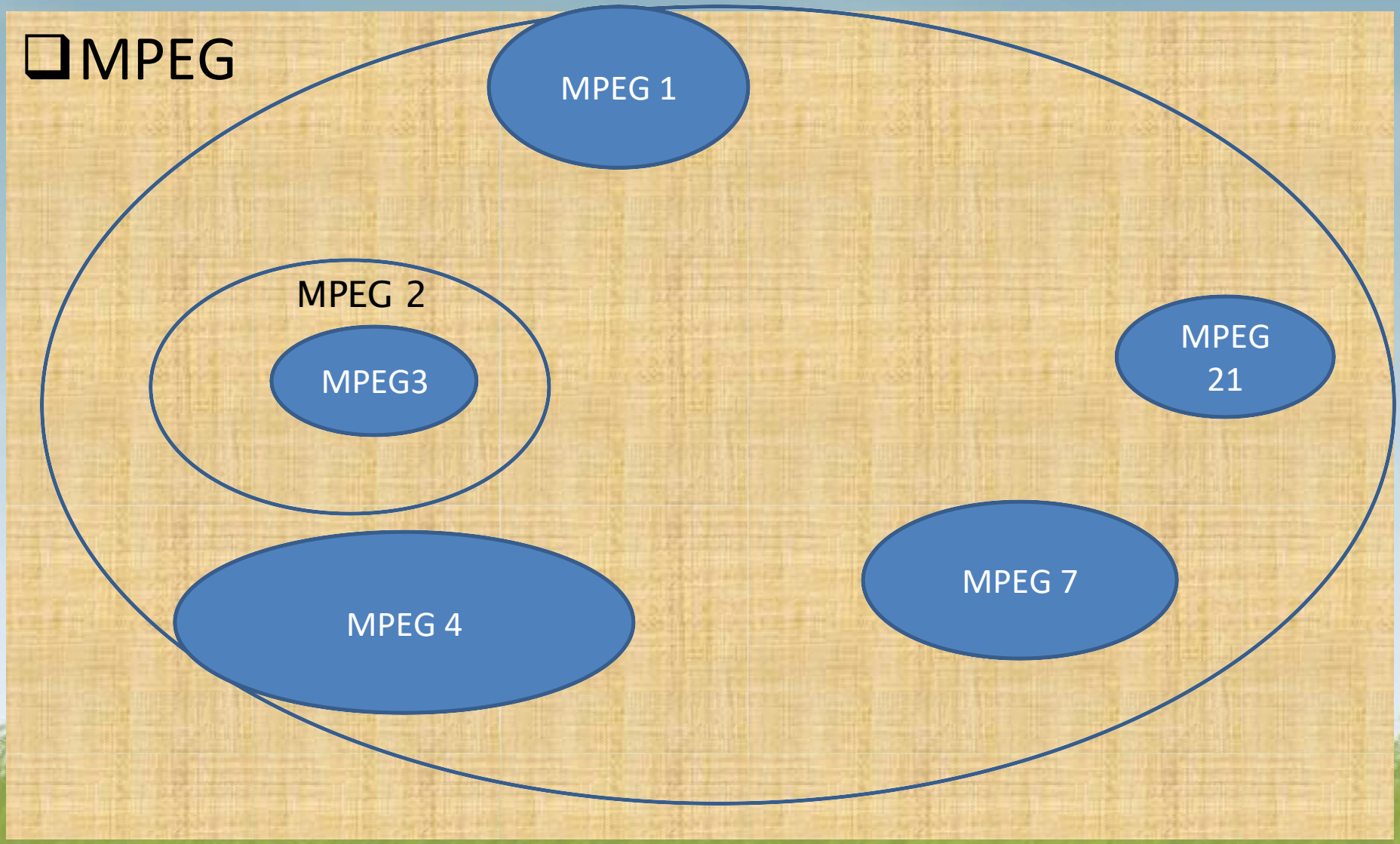


Types of MPEG Standards-

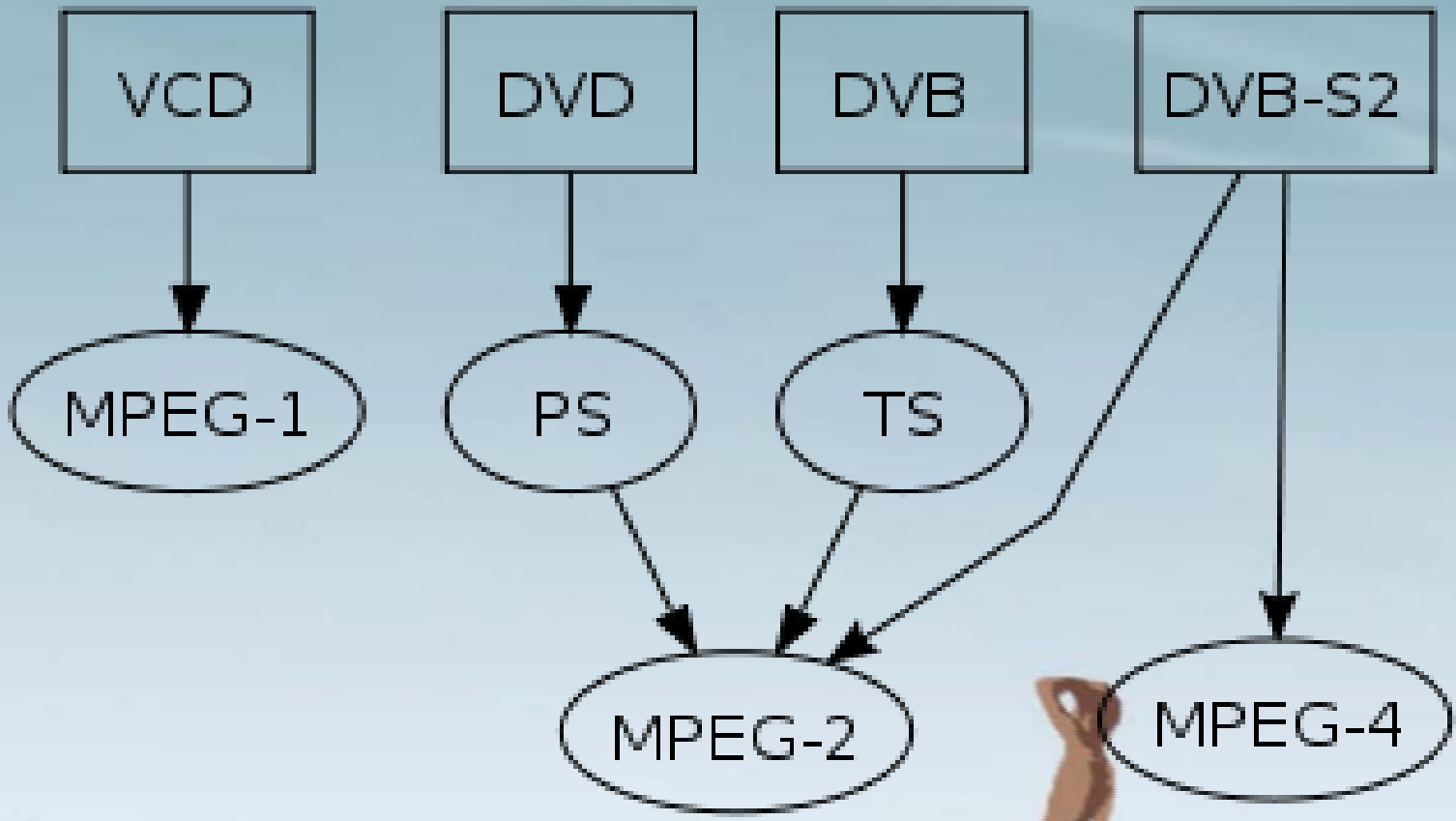
- MPEG 1
- MPEG 2
- MPEG 3
- MPEG 4
- MPEG 7
- MPEG 21



MPEG Standards



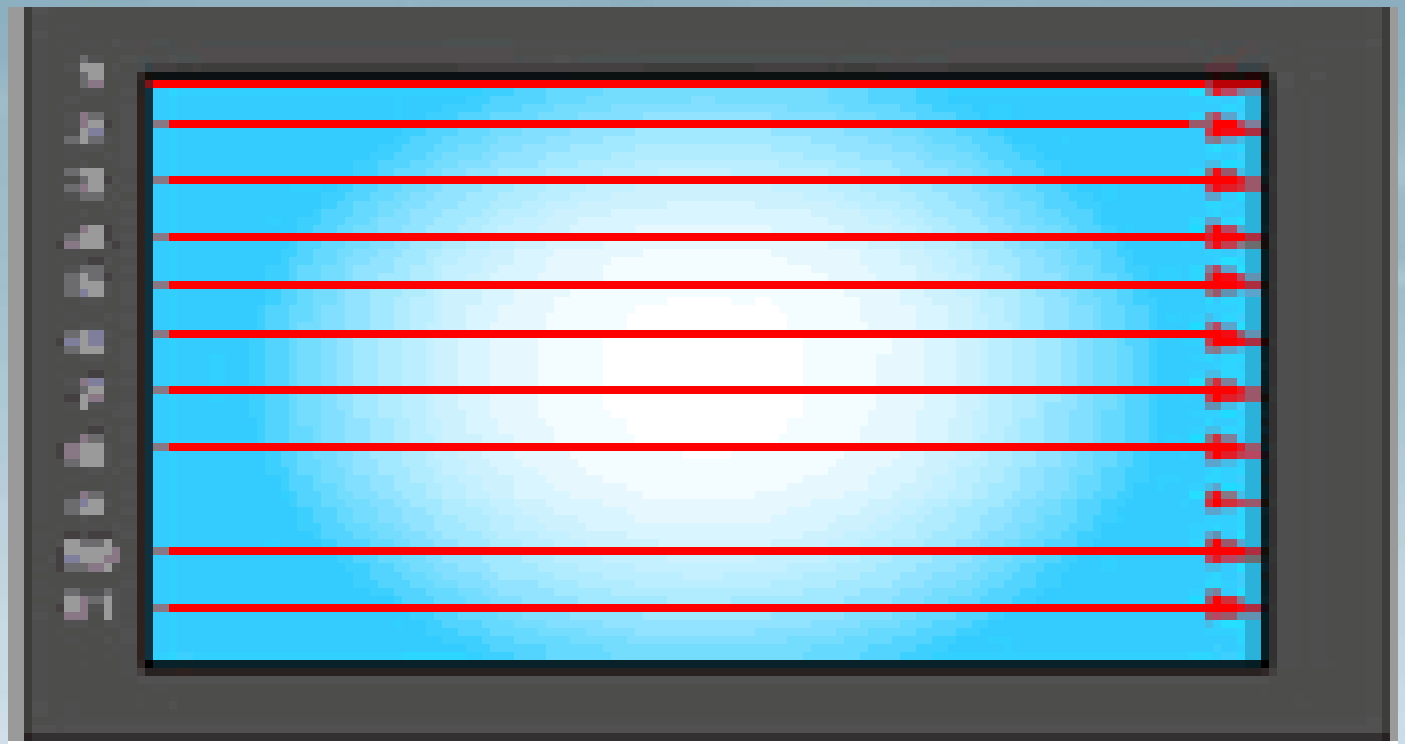
MPEG Product



MPEG1-

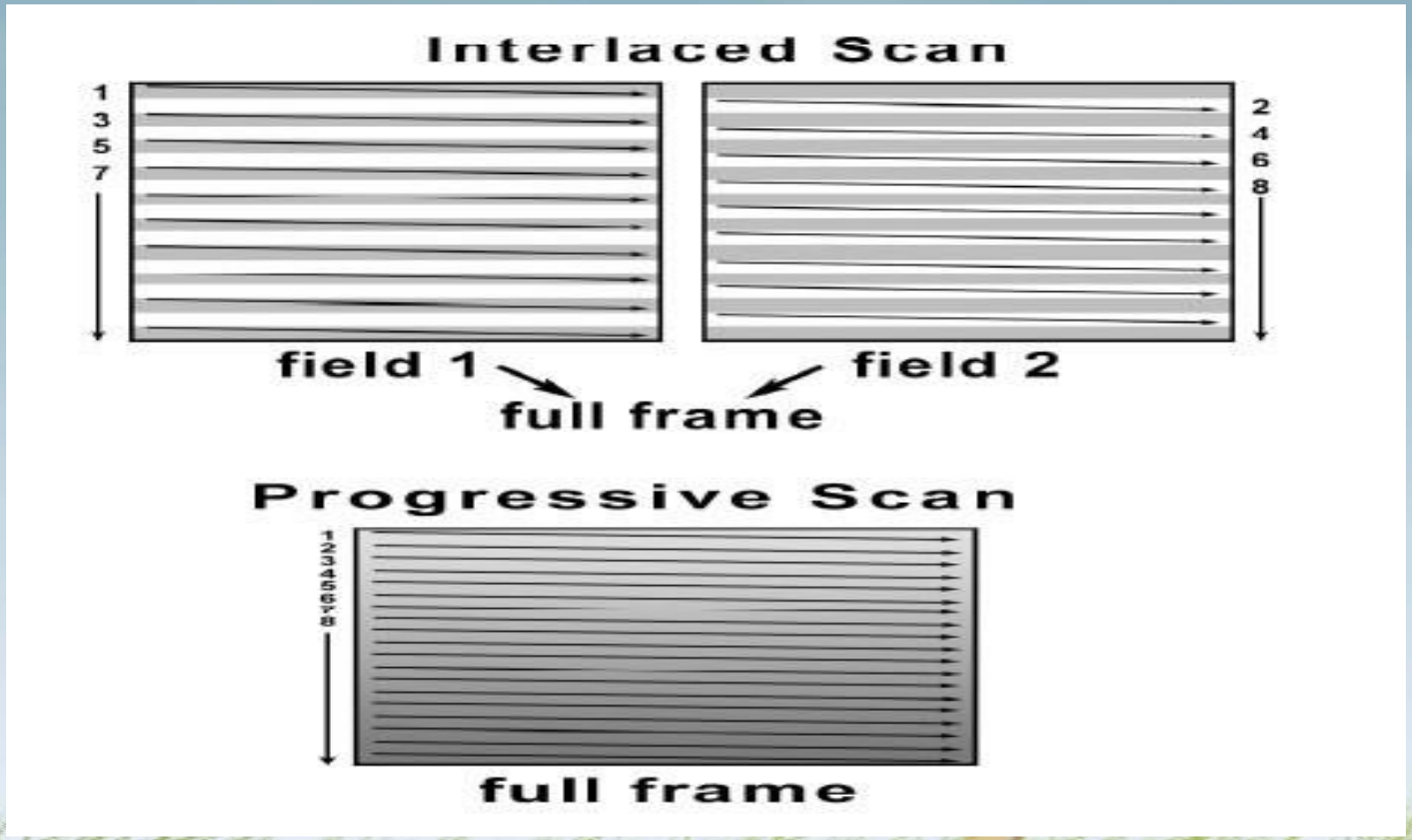
- Approved in Nov 1992 Standard for lossy video/audio compression
- Developed by ISO,IEC
- Designed to compress VHS-quality raw digital video and CD audio down to 1.5 Mbit/s
- Provide coding of Video and its associated Audio with speed 1.5 MBPS for digital storage media
- Extension of JPEG ,H.261
- Only supports progressive pictures

Progressive Scanning



One complete frame using progressive scanning

Progressive Vs Interlaced Scanning



Progressive Vs. Interlaced Frame-

Parts of MPEG1

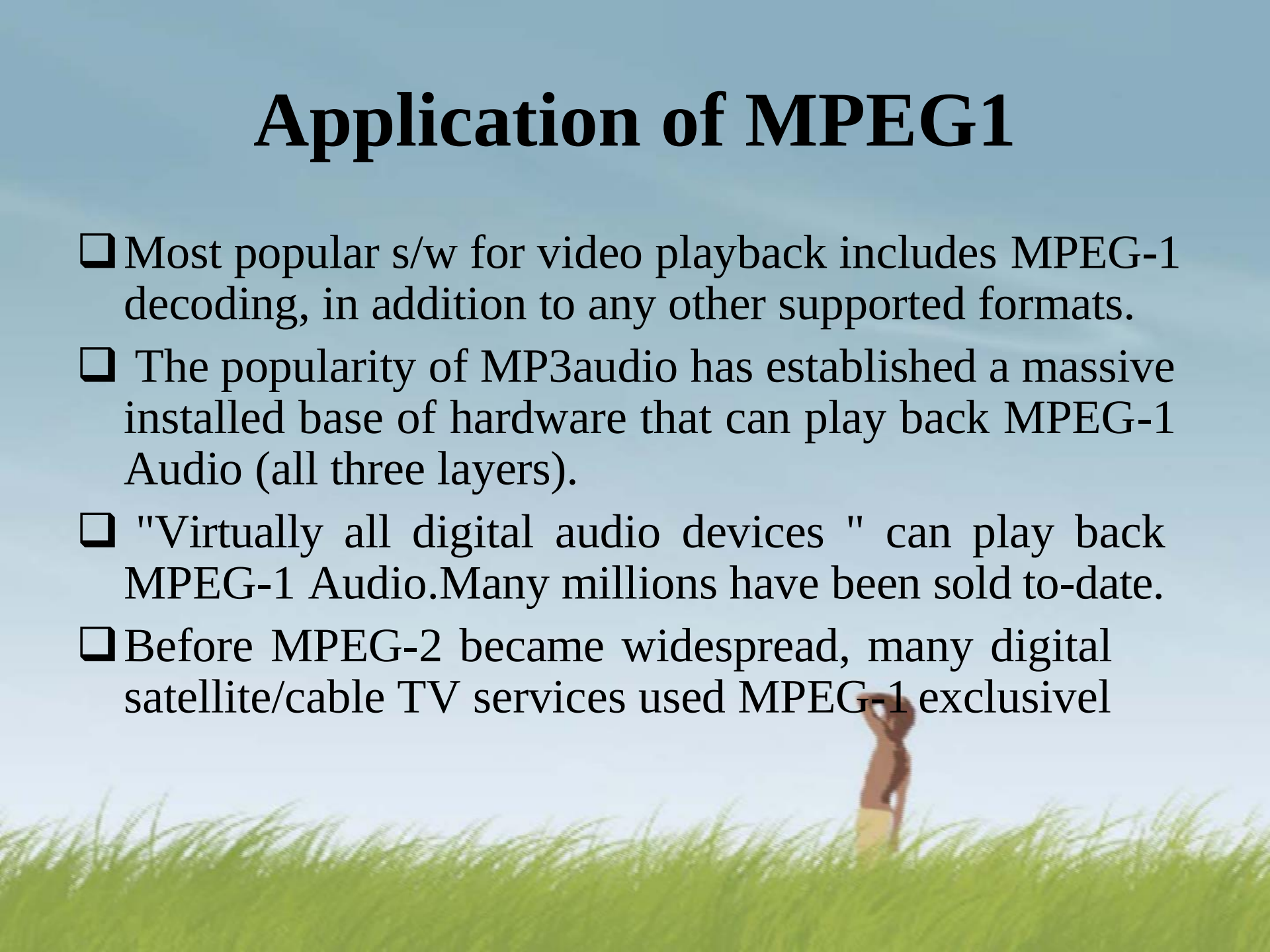
- Part 1 - MPEG-1 Systems - Program Stream
- Part 2 - MPEG-1 Video for CD –I
- Part 3 - MPEG-1 Audio
- Part 4 – Conformance
- Part 5 – Reference software

FILE Name &Extension of MPEG 1

- FILE NAME
  - .mpeg
  - .mpg
  - .mp1
- EXTENSION
  - .mp2
  - .mp3
  - .m1v
  - .m1a
  - .m2a, .mpa, .mpv

Application of MPEG1

- Most popular s/w for video playback includes MPEG-1 decoding, in addition to any other supported formats.
- The popularity of MP3audio has established a massive installed base of hardware that can play back MPEG-1 Audio (all three layers).
- "Virtually all digital audio devices " can play back MPEG-1 Audio.Many millions have been sold to-date.
- Before MPEG-2 became widespread, many digital satellite/cable TV services used MPEG-1 exclusivel



MPEG1- Video CD

MPEG1- CD Audio Player

Cont…

- The Super Video CD standard, based on VCD, uses MPEG-1 audio exclusively, as well as MPEG-2 video.
- Most DVD players also support Video CD and MP3 CD playback, which use MPEG-1
- The international Digital Video Broadcasting (DVB) standard primarily uses MPEG-1 Layer II audio, and MPEG-2 video.

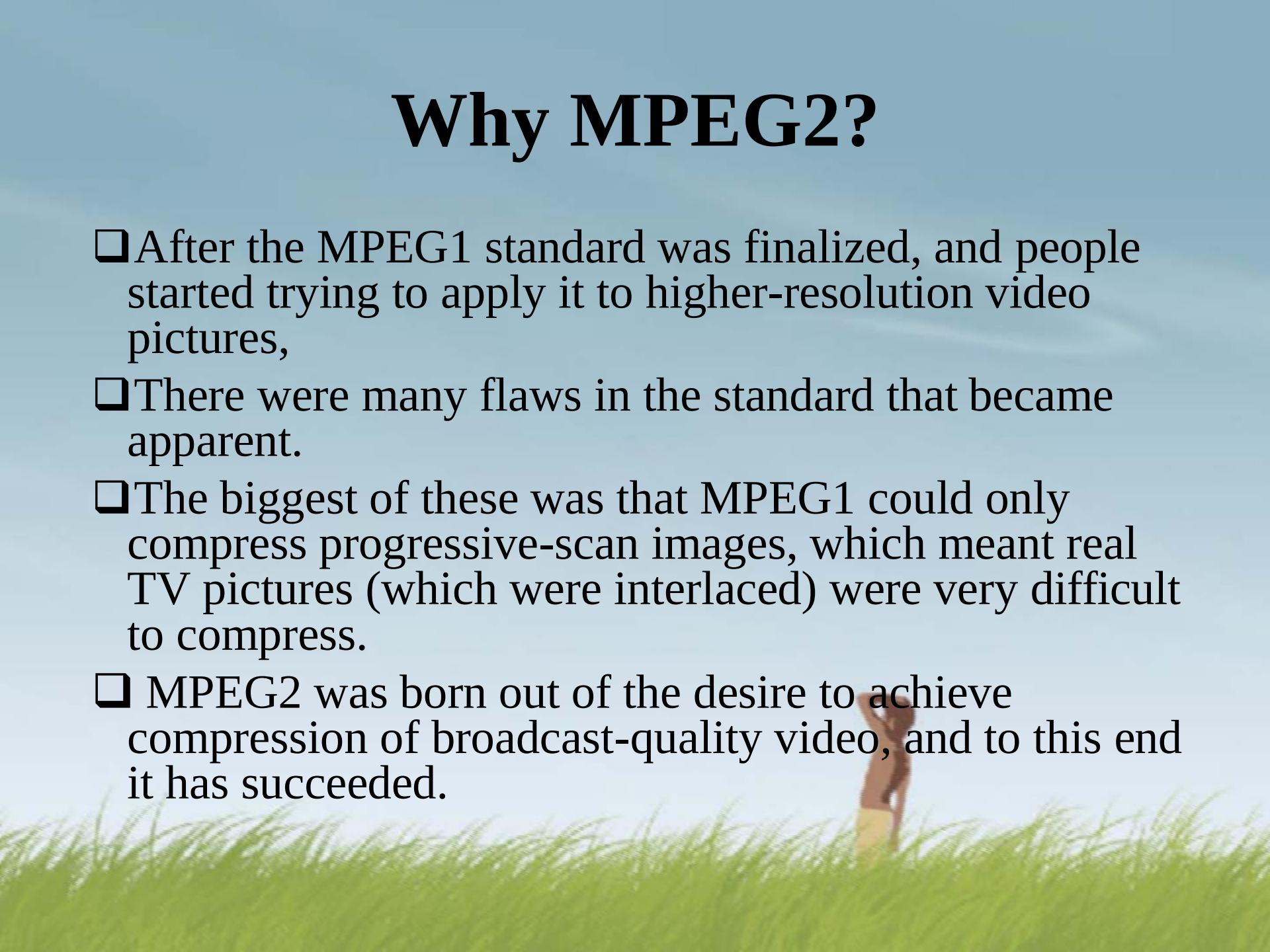
MPEG1- Frame Quality of Video

Drawback of MPEG 1

- Only support Progressive scanning
- Do not support broadcasting
- Low picture quality
- Achieve Low compression ratio

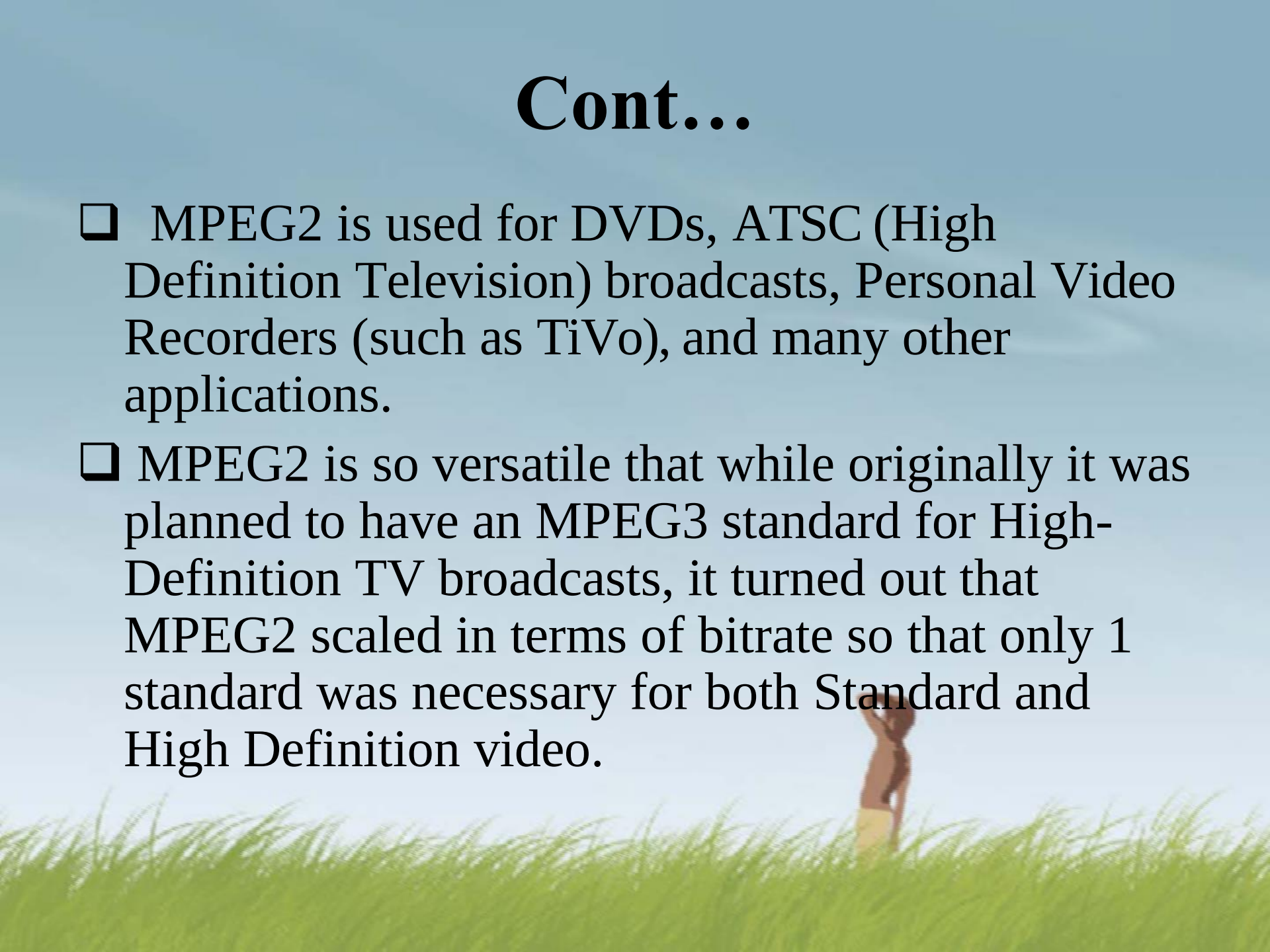
Why MPEG2?

- After the MPEG1 standard was finalized, and people started trying to apply it to higher-resolution video pictures,
- There were many flaws in the standard that became apparent.
- The biggest of these was that MPEG1 could only compress progressive-scan images, which meant real TV pictures (which were interlaced) were very difficult to compress.
- MPEG2 was born out of the desire to achieve compression of broadcast-quality video, and to this end it has succeeded.



Cont…

- MPEG2 is used for DVDs, ATSC (High Definition Television) broadcasts, Personal Video Recorders (such as TiVo), and many other applications.
- MPEG2 is so versatile that while originally it was planned to have an MPEG3 standard for High-Definition TV broadcasts, it turned out that MPEG2 scaled in terms of bitrate so that only 1 standard was necessary for both Standard and High Definition video.

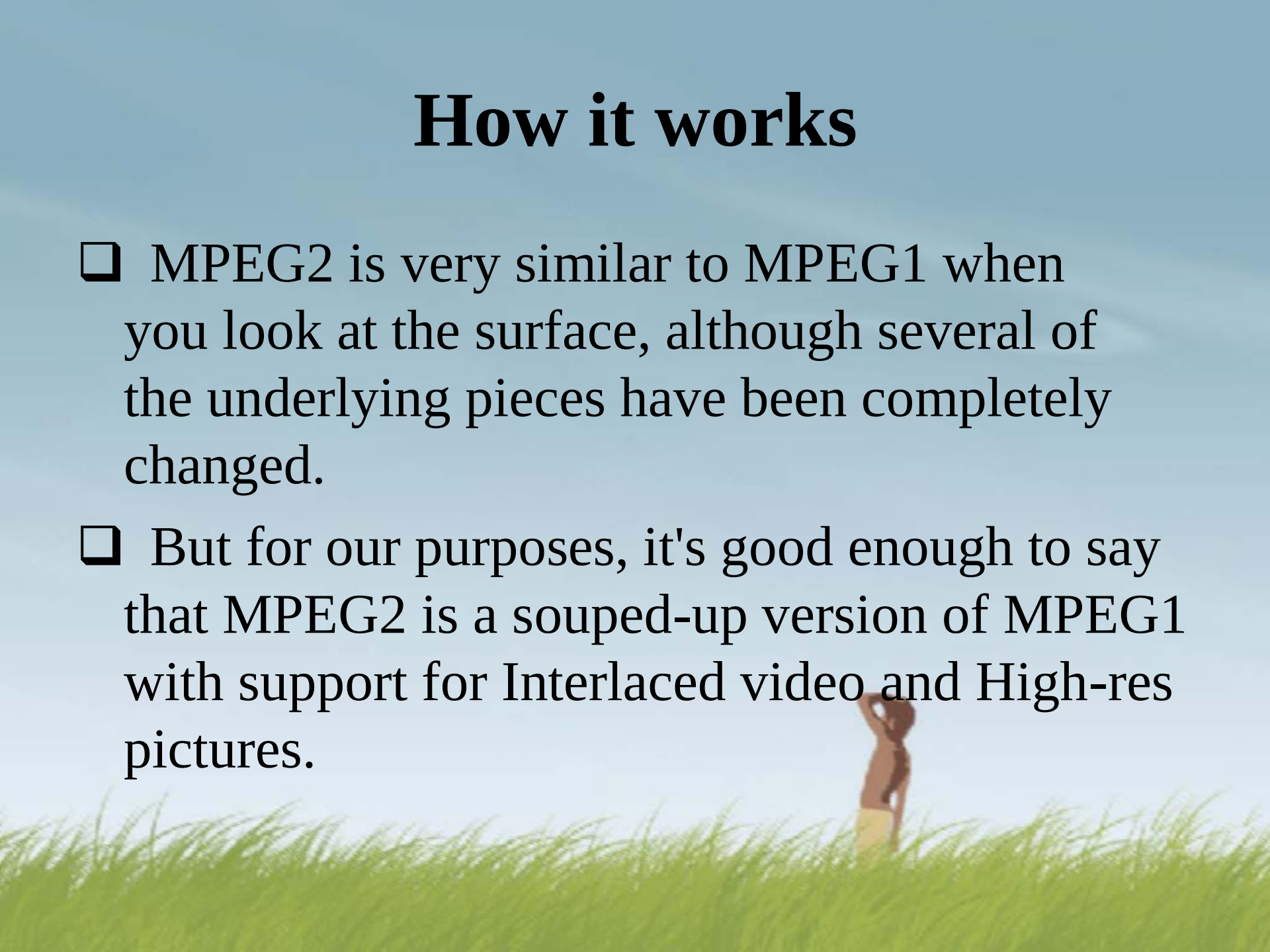


Main Parts Of MPEG 2

- Generic coding of moving pictures and associated audio
  - Part -1 Systems - joint with ITU
  - Part -2 Video - joint with ITU
  - Part -3 Audio
  - Part -4 Conformance
  - Part -5 Reference software
  - Part -6 DSM CC
  - Part -7 AAC - Advanced Audio Coding
  - Part -9 RTI - Real Time Interface

How it works

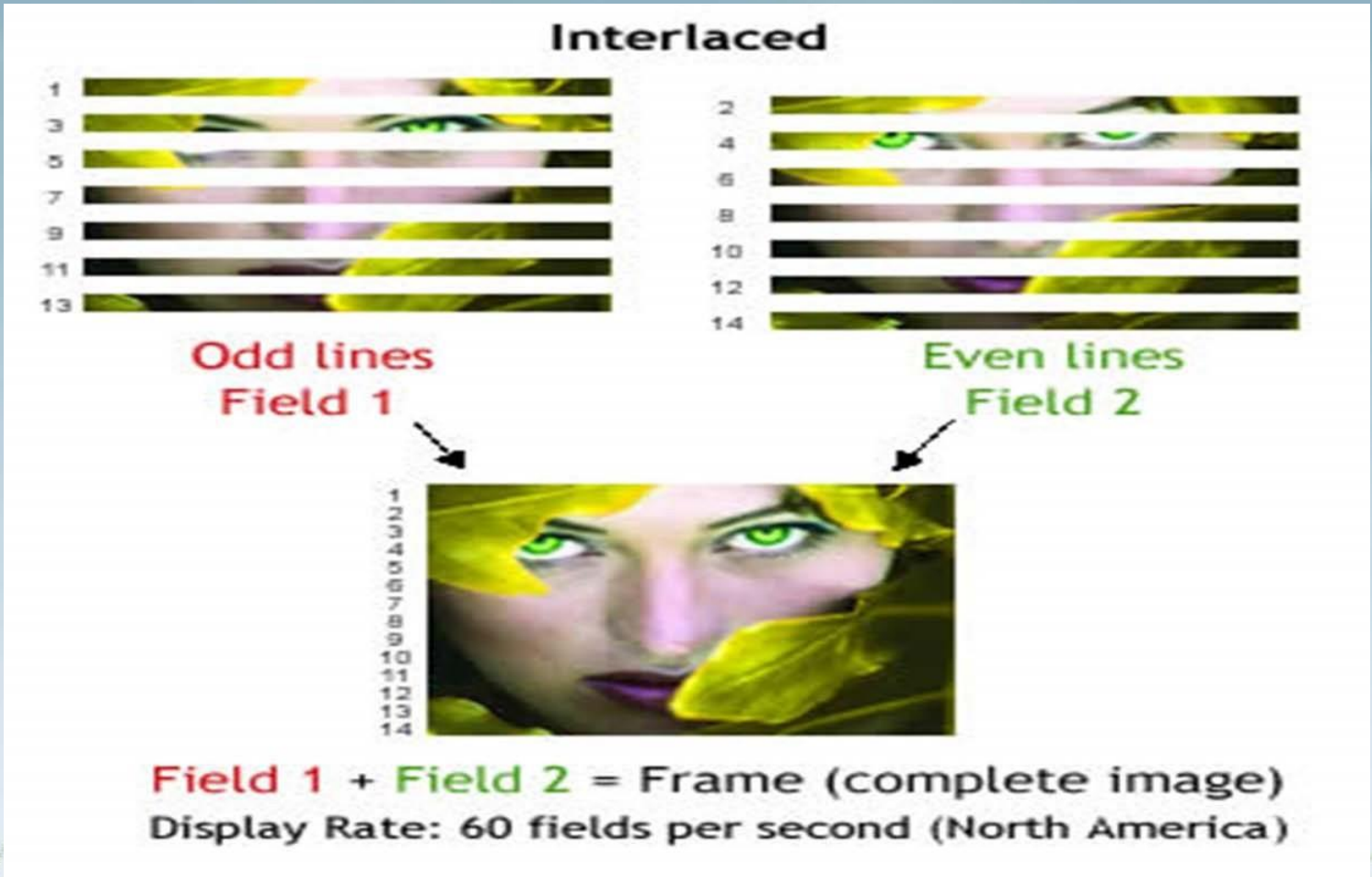
- MPEG2 is very similar to MPEG1 when you look at the surface, although several of the underlying pieces have been completely changed.
- But for our purposes, it's good enough to say that MPEG2 is a souped-up version of MPEG1 with support for Interlaced video and High-res pictures.



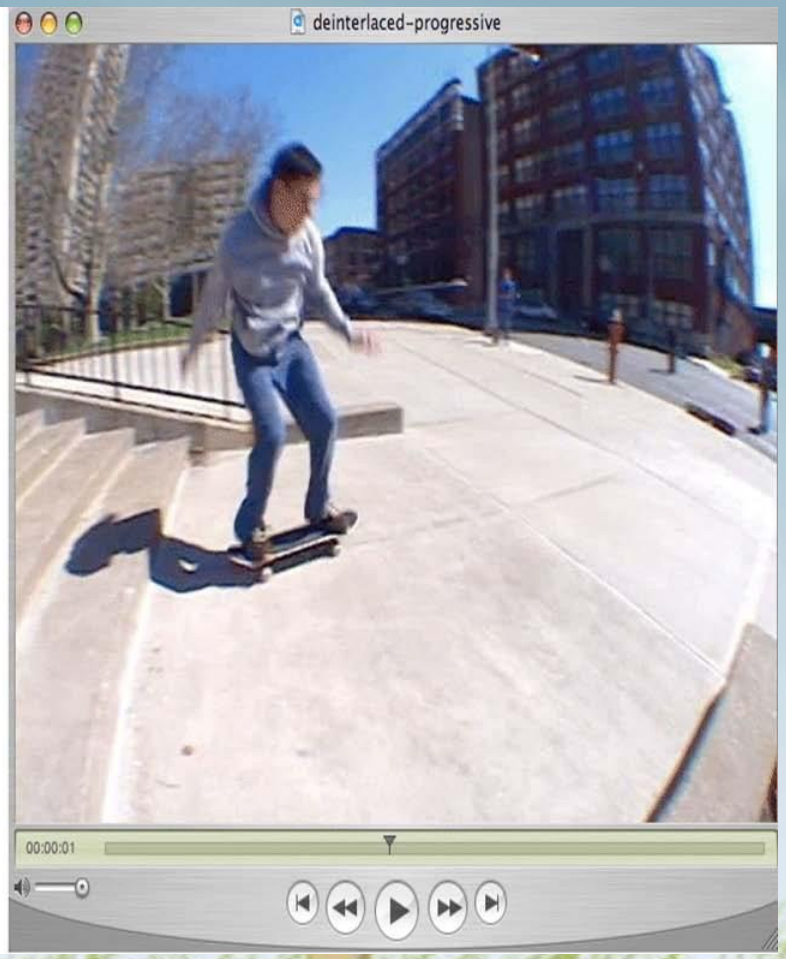
Advantage of MPEG2

- MPEG2 gives better picture quality than MPEG1 at full CCIR 601 resolution (720x480) and at comparable bitrate.
- MPEG 2 support scalling but MPEG1 not support it.
- MPEG 2 Support both Progressive and Interlaced Scanning but MPEG1 support only Progressive scanning.

Interlaced Scanning



Interlaced vs De-interlaced Video



Progressive and Interlaced Frame-

Progressive scan

Used in: Axis network cameras such as AXIS 232D.

Progressive scan details:

Interlaced scan

Used in: Analogue CCTV cameras.

Interlaced scan details:

2CIF

Used in: DVRs

2CIF details:

Disadvantage of MPEG2

- MPEG2 takes more CPU horsepower to decompress, and basically has no advantage over MPEG1 at lower resolutions.
- If you're distributing for the web, you're not going to want to be compressing stuff in MPEG2 instead of MPEG1 because the benefits of MPEG2 aren't realized until you get into full TV resolution, which means big filesizes.

MPEG 3

- Originally developed for HDTV, but abandoned when MPEG-2 was determined to be sufficient.

Why MPEG 4?

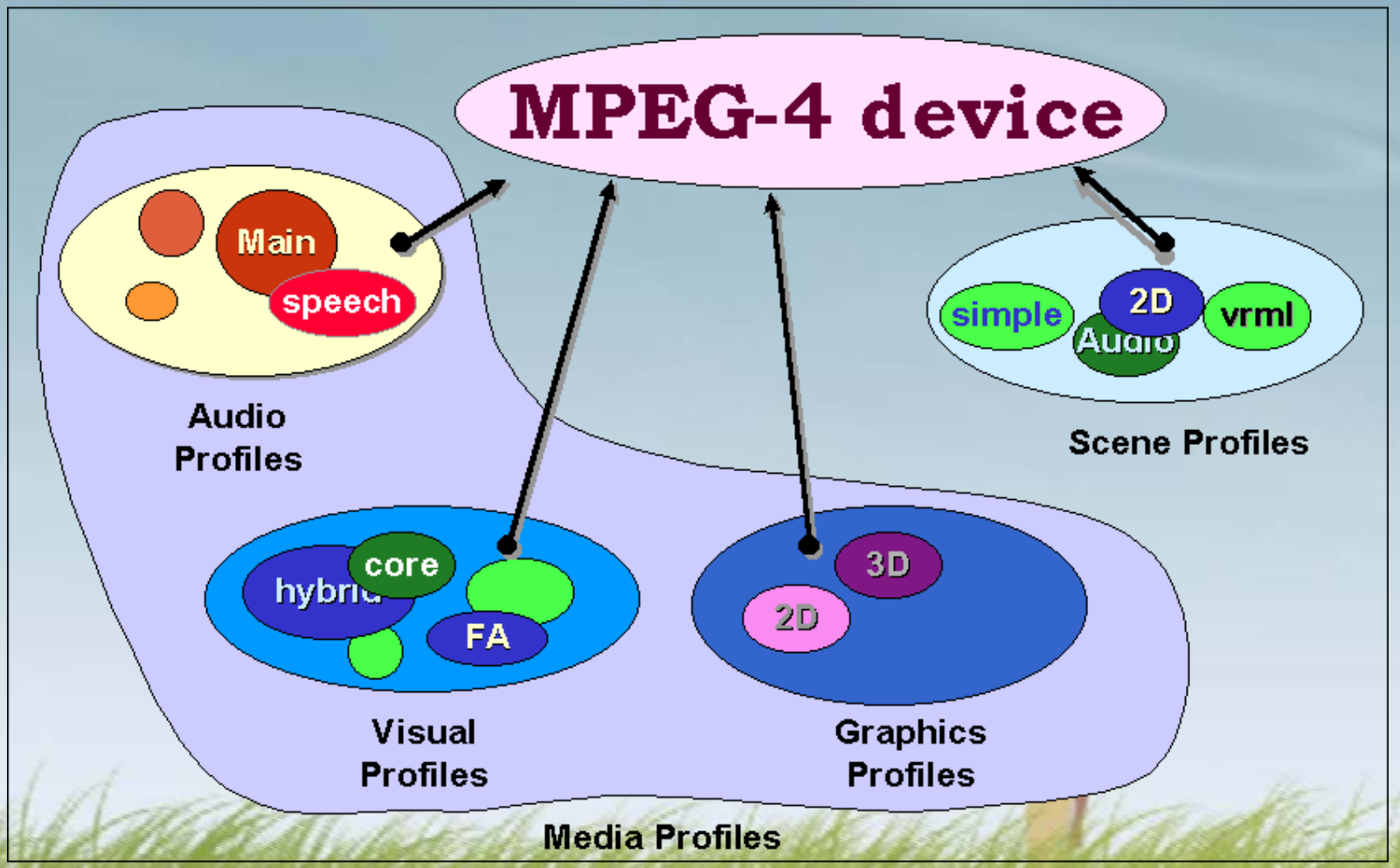
- MPEG-4 is a new multimedia standard that is designed for use in broadcast, interactive and conversational environments.

- The way MPEG-4 is built allows MPEG-4 to be used in Television and Web environments, not just the one after the other, but also facilitates integration of content coming from both channels in the same multimedia scene.

Cont…

- Its strong points are inherited from the successful MPEG-1 and -2 standards (broadcast-grade synchronisation and the choice of on-line/off-line usage) and VRML (the ability to create content using a scene description).

MPEG 4 In Multimedia Environment



MPEG4 Adds for MPEG1&2

- Integration of natural and synthetic content, in the form of objects. Such objects could represent 'recorded' entities (a person, a chair) or synthesised material (a voice, a face, an animated 3D model).
- Support for 2D and 3D content.
- Support for several types of interactivity.
- Coding at very low rates (2 Kbit/s for speech, 5 Kbit/s for video) to very high ones (5 Mbit for transparent quality Video, 64 Kbit/s per channel for CD quality Audio).
- Support for management and protection of intellectual property

Advantage &Application of MPEG 4

- MPEG-4 provides DVD quality video, but uses lower bit rate in comparison to MPEG 2 so that it's feasible to transmit digitized video streams in MAN , and also in WAN, where bandwidth is more critical, and hard to guarantee.

- Support video conferencing over Internet.

- MPEG-4 preserves compatibility with major existing standards: MPEG-1, MPEG-2, ITU-T H.263, and VRML.

MPEG -4 Video

Video conferencing Over Internet

Cont...

- Good video quality at reasonable bitrates
- Excellent cost/performance
- Near universal support by VMS
- Low latency

Disadvantage of MPEG 4-

- Not as efficient as H264


Thank YOU