GLACIER ICE
GEL REFRIGERANT

GLASS
THIS SIDE UP
HANDLE WITH CARE

750ml x12
2105# FL

6WL

1
00:00:04,309 --> 00:00:02,480
science tells us that light bends

2
00:00:06,559 --> 00:00:04,319
towards air that is more dense

3
00:00:08,299 --> 00:00:06,569
when looking towards the horizon this

4
00:00:10,910 --> 00:00:08,309
generally bends the light down because

5
00:00:12,890 --> 00:00:10,920
air is less dense as you get higher it

6
00:00:15,289 --> 00:00:12,900
has large changes in temperature than

7
00:00:17,870 --> 00:00:15,299
this can change things low cold air

8
00:00:19,130 --> 00:00:17,880
bends the light down more low warm air

9
00:00:22,099 --> 00:00:19,140
will bend the light upwards

10
00:00:23,509 --> 00:00:22,109
sometimes creating mirages but how can

11
00:00:25,939 --> 00:00:23,519
you demonstrate these effects for

12
00:00:28,070 --> 00:00:25,949
yourself it's actually easy to do with

13
00:00:29,720 --> 00:00:28,080

common items take a laser pointer and

14
00:00:32,030 --> 00:00:29,730
bounce it off a mirror the other end of

15
00:00:33,500 --> 00:00:32,040
the longest room you have this makes the

16
00:00:34,940 --> 00:00:33,510
position of the doc very sensitive to

17
00:00:37,790 --> 00:00:34,950
small bends at the start of the laser

18
00:00:40,010 --> 00:00:37,800
beam then take a flame and put it next

19
00:00:41,869 --> 00:00:40,020
to the laser heating up the air makes it

20
00:00:44,389 --> 00:00:41,879
expand which makes it less dense so the

21
00:00:47,720 --> 00:00:44,399
laser bends away from it and towards the

22
00:00:49,970 --> 00:00:47,730
cooler air further from the flame for

23
00:00:52,040 --> 00:00:49,980
cold air take a large ice pack or even a

24
00:00:54,260 --> 00:00:52,050
tray of ice cubes and position it under

25
00:00:56,299 --> 00:00:54,270
the beam this calls the air directly

26
00:00:58,639 --> 00:00:56,309
above the ice making it more dense and

27
00:01:01,729 --> 00:00:58,649
so bends have beam downwards towards the

28
00:01:02,389 --> 00:01:01,739
cold dense air what about changes in

29
00:01:04,939 --> 00:01:02,399
pressure

30
00:01:06,800 --> 00:01:04,949
I took a plywood board and slammed it

31
00:01:08,420 --> 00:01:06,810
down onto the beam this compresses the

32
00:01:10,730 --> 00:01:08,430
air ahead of the board making it more

33
00:01:13,160 --> 00:01:10,740
dense so you'd expect the first movement

34
00:01:15,160 --> 00:01:13,170
of the beam to be upwards this is hard

35
00:01:17,899 --> 00:01:15,170
to see in this shot but it is measurable

36
00:01:19,999 --> 00:01:17,909
if we were repeated in slow motion this

37
00:01:22,039 --> 00:01:20,009
initial movement becomes more obvious up

38
00:01:25,760 --> 00:01:22,049

towards the wave of higher pressure more