

Smash hit: On NASA's Double Asteroid Redirection Test

NASA's **DART** gives hope that science can **ward off extraterrestrial** threats

For the very first time, NASA scientists have **succeeded** in **slightly altering** the **trajectory** of an asteroid by using a spacecraft to **slam into** it. On September 27, 4.44 a.m. IST, a small spacecraft DART (Double Asteroid Redirection Test) was aimed at a 160-metre-wide asteroid Dimorphos, which was **orbiting** a larger asteroid Didymos, both of which were circling the sun, 11.2 million kilometres from the earth. Since neither body would have come closer than about 6.4 million km of the earth in their lifetime, they did not **pose** any threat. However, DART was a test mission to see if **this technique**, known as **kinetic impactor**, **would** give the necessary 'nudge' to an asteroid and **alter** its **course** by a desired amount. After studying the two bodies for nearly 10 days, NASA announced that **the course** of the smaller asteroid **has indeed** been altered a little: initially, **the orbit** of Dimorphos around Didymos **took** 11 hours and 55 minutes. After the impact, a 32-minute alteration in its **orbital period** has **taken place** — it is now 11 hours and 23 minutes only. The reason for this test is to learn how to use the kinetic impactor technique to 'nudge' **earth-bound** asteroids **out of the way**, years before impact. This is not a **last-minute** effort. A word of caution: all asteroids are not similar, so more tests have to be done to **perfect** this technique.

The U.S. is not alone in attempting this. China has a plan to **deflect** a 40 m wide, earth-crossing asteroid named 2020PN1 by 2026. There is a need to develop this technique because an **impact** with even a small asteroid **can** have serious consequences. The Chicxulub **crater** is a **reminder** of the impact of a 10 km wide large asteroid that fell on the earth 66 million years ago and **wiped out** nearly 75% of plant and animal life. An **impact** with an asteroid even about 100 m wide **can** destroy a city the size of Chennai. The other question is whether this technique can be used to deflect asteroids **bearing** rich **bounties** of minerals and moving them to closer locations from where these can be **harvested**. No country has made this an **explicit aim** till now. This first **move** by NASA to alter the course of a **celestial body is** a perfect **theme** for **fiction** and film; most recently, the film "Don't Look Up" dealt with this theme directly. However, there are many more threats to life on earth, climate change being the most **imminent** and **definite**. It is to be hoped that this **demonstration** of the power of engineering and science **can** be **extrapolated** to '**kick-start**' a move to avoid the **drastic** impact of such **disasters** too.

[Practice Exercise]

- **Disaster** (noun) – an event that causes a lot of harm or damage आपदा
- Red/blue coloring of words in the sentence indicates subject verb relationship; where 'red' denotes 'subject' and 'blue' denotes 'verb'.

Vocabulary

1. **Smash hit** (phrase) – An outstanding success
2. **Double Asteroid Redirection Test (DART)** (noun) – a NASA space mission aimed at testing a method of planetary defense against near-Earth objects. It was designed to assess how much a spacecraft impact deflects an asteroid through a transfer of momentum by hitting the asteroid head on and attempting to slow it.
3. **Asteroid** (noun) – small, rocky objects that orbit the Sun क्षुद्रग्रह
4. **Ward off** (phrasal verb) – Deflect, keep at bay, fend off दूर करना (खतरों को)
5. **Extraterrestrial** (adjective) – in or coming from a place outside the planet Earth अलौकिक
6. **Succeed** (verb) – Attain success or reach a desired goal सफल होना
7. **Slightly** (adverb) – To a small degree or extent थोड़े रूप में
8. **Alter** (verb) – change, make changes to, make different, make alterations to बदलना
9. **Trajectory** (noun) – Path, arc, curve, track, course प्रक्षेप-पथ
10. **Slam into** (phrasal verb) – To collide with someone or something in a very forceful or violent manner. टकराना
11. **Orbit** (verb) – a curved path taken by a planet or another object as it moves around another planet, star, moon, etc ग्रह-उपग्रह का परिक्रमा-पथ
12. **Pose** (verb) – Cause, create, present, produce खड़ा करना (खतरा)
13. **Kinetic impactor** (noun) – it involves sending one or more large, high-speed spacecraft into the path of an approaching near-earth object.
14. **Nudge** (noun) – the act of pushing someone or something gently धकेलना
15. **Course** (noun) – Route, path, way, track, line, direction मार्ग
16. **Indeed** (adverb) – as expected, to be sure, in fact, in point of fact वास्तव में
17. **Orbital period** (noun) – the amount of time a given astronomical object takes to complete one orbit around another object.
18. **Take place** (phrase) – Happen, occur, come about, come off, transpire घटित होना
19. **Earth-bound** (adjective) – restricted to the earth. पृथ्वी से बंधे हुए

20. **Out of the way** (phrase) – (of a place) remote or secluded दूर
21. **Last-minute** (adjective) – done or occurring at the latest possible time before an event. अंतिम समय में
22. **Perfect** (verb) – to make something perfect परिष्कृत करना
23. **Deflect** (verb) – divert, avert, distract, turn away, fend off मोड़ना
24. **Chicxulub crater** (noun) – an impact crater buried underneath the Yucatán Peninsula in Mexico
25. **Crater** (noun) – a large hole in the ground बड़ा गड्ढा
26. **Reminder** (noun) – something that makes you remember something अनुस्मारक
27. **Wipe out** (phrasal verb) – eliminate, destroy, annihilate, eradicate, obliterate मिटा देना
28. **Bear** (verb) – Carry, take, take; to have something पास होना
29. **Bounty** (noun) – Abundance, plenty, plenteousness, glut प्रचुरता
30. **Harvest** (verb) – to collect a natural resource in order to use it effectively संचयन करना
31. **Explicit** (adjective) – clear, definite, unequivocal, plain, unambiguous स्पष्ट
32. **Aim** (noun) – purpose, goal, objective, aspire, target लक्ष्य साधना
33. **Celestial body** (noun) – A natural object which is located outside of Earth's atmosphere, such as a comet, an asteroid, the Moon, a planet, the Sun, or a star.
34. **Theme** (noun) – The subject matter of a conversation or discussion विषय
35. **Fiction** (noun) – a false report or statement that you pretend is true कल्पना, कथा साहित्य
36. **Imminent** (adjective) – impending, forthcoming, approaching, at hand, close करीब
37. **Definite** (adjective) – certain, sure, clear, positive, distinct निश्चित, निर्दिष्ट
38. **Demonstration** (noun) – presentation, display, evidence, show प्रदर्शन
39. **Extrapolate** (verb) – Infer, induce, generalize, reason, deduce, conclude अनुमान करना, निष्कर्ष निकालना
40. **Kick-start** (verb) – restart, revive, revitalize, renew, regenerate, restore, शुरू करना
41. **Drastic** (adjective) – Radical, severe, extreme, dire भीषण, उग्र

Practice Exercise

Direction (Q1 – Q3): Select the best express synonym of the given words [Editorial page]

1. It is to be hoped that this demonstration of the power of engineering and science can be **extrapolated** to 'kick-start' a move to avoid the drastic impact of such disasters too.
A. Ephemeral
B. Nefarious
C. Robust
D. Infer
2. There are many more threats to life on earth, climate change being the most **imminent** and definite.
A. Castigate
B. Munificent
C. Impending
D. Abhor
3. The other question is whether this technique can be used to deflect asteroids bearing rich **bounties** of minerals and moving them to closer locations
A. Bovine
B. Abundance
C. Analogy
D. Mercenary

4. **Idioms & Phrase**

Yes, you're doing well with chords, but if you want to play entire songs, you still **have a long way to go**.

- A. Taking the most pessimistic or unfavourable view
B. To reach or come to a place, condition, or situation that was not planned or expected
C. To make a difficult situation even worse for someone
D. Much more to do in order to achieve something
5. **Direction: Six statements are given below, which are jumbled in any random order. These statements will form a coherent and meaningful paragraph, when arranged in the correct sequence. Arrange the sentences in the right order and answer the questions that follow.**

Prime Minister Narendra Modi's three-nation visit to Europe comes at a time when the continent is facing its biggest security crisis since the end of the Cold War.

P. In the last leg, the Prime Minister held talks in Paris with French President Emmanuel Macron, who was re-elected recently.

Q. In Copenhagen, Mr. Modi attended the India-Nordic summit with leaders of Denmark, Norway, Sweden, Finland, and Iceland.

R. While bilateral issues are at the centre of these meetings, the elephant in the room is the Russian invasion of Ukraine.

S. In Germany, Mr. Modi and Chancellor Olaf Scholz reiterated the partnership between the two countries.

T. Berlin has also announced €10 billion for bilateral cooperation.

U. Mr. Modi's trip comes a few days after the President of the European Commission, Ursula von Der Leyen, visited India.

Which among the following will be the **Third** sentence of the paragraph after the rearrangement?

A. P

B.S

C.U

D.Q

E.R

Direction (Q6 – Q9): Read the given sentences to find out whether there is any grammatical error in them

6. A. In spite of the fact that organizations are aware of the importance of IT they often do not know how to deploy it effectively.
B. Please convey my best wishes back to your parents.
C. Keeping in mind that India is one of the world's fastest growing economics many international companies are investing in India.
D. Although interlinking of rivers will help tackle drought, the government has not paid much attention to this project.
E. All are correct
7. A. The rise in prices of food items is likely to cause the inflation to exceed eight per cent during the next quarter.
B. Many people believe that the nationalization of banks in the 1960s has protected India from the current financial crisis.
C. RBI is in favour of amending current policies governing operations of foreign banks in India.
D. These recently upgraded branch offices have been fully computerized and are connected to headquarters to ensure proper monitoring.
E. All are correct
8. I did not know (A)/ where they were going (B)/nor could I understand (C)/ why had they left so soon. (D)/ No Error (E)
9. The distinguished visitor said that he had great pleasure to be with us for some time (A)/ and that the pleasure was all the greater (B)/ because his visit afforded him an opportunity to study the working (C)/ of an institution of such eminence as ours.(D)/No Error(E)
10. **Find out the misspelt word**
A. Stringent
B. Purportedly
C. Accommodation
D. Encroachment

Direction: Read the passage given below and answer the following questions.

The Iranian Foreign Ministry's comment, that only "Salman Rushdie and his supporters" were to be blamed for the _____**11**_____ knife attack on the author in New York State last week, is yet another reiteration of the clerical establishment's well-known regressive position on the Rushdie affair. The 1989 fatwa against Rushdie, issued by Iran's then Supreme Leader Ayatollah Khomeini, because he believed the author's The Satanic Verses was _____**12**_____, has already wreaked

enough havoc across the world. It was a rare instance of a leader of a country issuing an extra-territorial death sentence against an author who was living in another country by invoking his pan-Islamist beliefs and clerical authority. Dozens were killed in riots. The book's translators and publishers were attacked. It drove Rushdie underground for years. Thirty-three years later, Rushdie was attacked by a 24-year-old American citizen of Lebanese descent, whose social media accounts are reportedly filled with pro-Khomeini and pro-Iran content. Iran has denied any role. It is _____**13**_____ that Iran could not even issue a statement condemning the attack and the attacker. **Worse (A)**, pro-state media in Iran **depraved (B)** "the courageous and duty-conscious man who attacked the **apostate (C)** and **applauded (D)** Salman Rushdie in New York".

In 1998, Kamal Kharrazi, Foreign Minister in the government of reformist President Mohammad Khatami, announced in New York that Iran would not attempt to kill Rushdie. **(1)/** As it was generally interpreted as an informal revocation of the fatwa, the U.K. normalised ties with the Islamic Republic. **(2)/** But hardliners tightened their grip on Iran's institutions once Khatami's two terms came to an end in 2005. **(3)/** In the past, Iran's government had stayed away from Khomeini's fatwa. **(4)/** In the same year, Ayatollah Khamenei repeated Khomeini's position — that Rushdie was "an apostate whose killing would be authorised by Islam". In 2019, the Ayatollah's Twitter account was briefly suspended after he said the fatwa was "solid and irrevocable", The **edict** clearly made matters worse for Rushdie, but it did not stop him from writing. He wrote some of his finest fiction and essays during this period, disproving, as Christopher Hitchens put it, "Orwell's fine but _____**14**_____ dictum that 'the imagination, like certain wild animals, will not breed in captivity'". Rushdie continued to live under the Ayatollah's sword, but remained a champion of the freedoms he believed in, something which those who bayed for his blood never managed to reconcile with.

Iran may not have a direct role in the attack. **(A)/** But as the fatwa issued by the leader of its revolution have **(B)/** hunted down this harmless man of words for over three decades, Iran has the moral responsibility, **(C)/** at least now when he is recovering from serious wounds, to revoke the fatwa and unequivocally condemn the attack. **(D)**

Fill in the blank with the most appropriate word given in the option (From Q11 – Q14)

11. The Iranian Foreign Ministry's comment, that only "Salman Rushdie and his supporters" were to be blamed for the _____**11**_____ knife attack on the author in New York State last week
 - A. Cryptic
 - B. Stagnation
 - C. Gruesome
 - D. Dormant
12. The 1989 fatwa against Rushdie, issued by Iran's then Supreme Leader Ayatollah Khomeini, because he believed the author's The Satanic Verses was _____**12**_____, has already wreaked enough havoc across the world.
 - A. Hapless
 - B. Blasphemous
 - C. Fatuous
 - D. Foment

13. It is _____13_____ that Iran could not even issue a statement condemning the attack and the attacker.
- A. Lethargy
 - B. Astonishing
 - C. Prodigy
 - D. Contiguous
14. He wrote some of his finest fiction and essays during this period, disproving, as Christopher Hitchens put it, "Orwell's fine but _____14_____ dictum that 'the imagination, like certain wild animals, will not breed in captivity'".
- A. Fallacious
 - B. Autonomous
 - C. Antipathy
 - D. Duplicity
15. **The following sentence may or may not contain an error in one of its parts. Identify the part containing the error. If the sentence is correct, select 'No error' as your answers.**
- Iran may not have a direct role in the attack. **(A)**/ But as the fatwa issued by the leader of its revolution have **(B)**/ hunted down this harmless man of words for over three decades, Iran has the moral responsibility, **(C)**/ at least now when he is recovering from serious wounds, to revoke the fatwa and unequivocally condemn the attack. **(D)**
- A. (A)
 - B. (B)
 - C. (C)
 - D. (D)
 - E. No Error
16. **Rearrange the sentence to form a meaningful sentence.**
- In 1998, Kamal Kharrazi, Foreign Minister in the government of reformist President Mohammad Khatami, announced in New York that Iran would not attempt to kill Rushdie. **(1)**/As it was generally interpreted as an informal revocation of the fatwa, the U.K. normalised ties with the Islamic Republic. **(2)**/ But hardliners tightened their grip on Iran's institutions once Khatami's two terms came to an end in 2005. **(3)**/ In the past, Iran's government had stayed away from Khomeini's fatwa. **(4)**
- A. 4123
 - B. 1234
 - C. 4132
 - D. 2143
 - E. 3241
17. Given below is a word, followed by three sentence that consist of that word. Identify the sentence (S) that best express (es) the meaning of the word. Choose option 5 'None of the above' if the word is not suitable in any of the sentence

EDICT

- (i) A separate **edict** concurrently issued to him showed that the colonisation of the aboriginal territories had been approved as government policy.
- (ii) In 1741 Catherine the Great issued an **edict** of toleration for Buddhism.
- (iii) The complaint against the bar could lead to **edict** of its licence.
- A. Only (i)
B. Only (ii)
C. Only (iii)
D. (i), (ii)
E. (ii), (iii)
18. In the following question, a sentence is given with four words marked as (A), (B), (C), and (D). These words may or may not be placed in the correct order. Four options with different arrangements of these have been provided. Mark the option with the correct arrangement as the answer. If no rearrangement is required, mark option (5) as your answer.
Worse (A), pro-state media in Iran **depraved (B)** "the courageous and duty-conscious man who attacked the **apostate (C)** and **applauded (D)** Salman Rushdie in New York".
- A. C – A
B. A – D
C. B – D
D. D – C
E. No arrangement
19. Select the connector from the given options which can be used to form a single sentence from the two sentences given below, implying the same as expressed in the statement sentence.
- (i) Chocolate is Pooja's favorite food
(ii) She does not like chocolate with peanuts."
- A. Whereas
B. Furthermore
C. Although
D. Unless
20. Fill the appropriate preposition in the given blanks
My dog was clearly vexed _____ me for having been gone all week, and hardly greeted me when I came home
- A. Of
B. From
C. With
D. To

Answers

1. D 2. C 3. B 4. D 5. D 6. B 7. E 8. D 9. C 10. D 11. C 12. B
 13. B 14. A 15. B 16. A 17. D 18. C 19. C 20. C

[\[Practice Exercise\]](#)

Explanations

4. **A long way to go** (phrase) – Much more to do in order to achieve something

5. **STQPRU**

Prime Minister Narendra Modi's three-nation visit to Europe comes at a time when the continent is facing its biggest security crisis since the end of the Cold War. In Germany, Mr. Modi and Chancellor Olaf Scholz reiterated the partnership between the two countries. Berlin has also announced €10 billion for bilateral cooperation. In Copenhagen, Mr. Modi attended the India-Nordic summit with leaders of Denmark, Norway, Sweden, Finland, and Iceland. In the last leg, the Prime Minister held talks in Paris with French President Emmanuel Macron, who was re-elected recently. While bilateral issues are at the centre of these meetings, the elephant in the room is the Russian invasion of Ukraine. Mr. Modi's trip comes a few days after the President of the European Commission, Ursula von Der Leyen, visited India.

6. 'back' का प्रयोग अनावश्यक है क्योंकि 'convey something (to somebody)' का प्रयोग होता है। देखें-

i. Please convey my apologies to your wife.

➤ Use of 'back' is unnecessary because 'convey something (to somebody)' is used. see-

i. Please convey my apologies to your wife.

8. 'why had they' के बदले 'why they had' का प्रयोग होगा क्योंकि Part (D) में Question नहीं है बल्कि Part (C) में प्रयुक्त 'understand' क्रिया का Object है, और 'why' से शुरू होने वाला Clause एक Noun Clause होगा जो Object का काम करेगा। Question में 'Interrogative Word + Auxiliary + Subject...' का प्रयोग होता है, जबकि Clause में 'Interrogative Word + Subject + Verb' का; जैसे-

i. Why is he crying? [Question]

ii. I do not understand/know why he is crying.

'यहाँ (ii) वाक्य में 'why he is crying' एक Noun Clause है।

➤ 'why had they' will be replaced with 'why they had' because the part (D) does not contain the question but the object of the verb 'understand' used in the part (C), and clause starting with 'why' will be a Noun Clause which will act as Object. 'Interrogative Word + Auxiliary + Subject...' is used in the Question, while in the Clause 'Interrogative Word + Subject + Verb'; As-

i. Why is he crying? [Question]

ii. I do not understand/know why he is crying.

9. 'afford' के बदले 'offered' का प्रयोग होगा क्योंकि 'afford' का अर्थ है 'have money or time to be able to buy or to do something' अर्थात् 'कोई चीज खरीदने या करने में सक्षम होना' जबकि 'offer' का अर्थ है 'provide the opportunity for something' अर्थात् 'किसी चीज के लिए अवसर प्रदान करना'; जैसे-

i. He cannot afford a new car.

ii. I offered him a job.

iii. This job does not offer any prospects for promotion.

➤ 'offered' shall be used instead of 'afford' because 'afford' means 'have money or time to be able to buy or to do something' whereas 'offer' means 'provide the opportunity for something'; As-

i. He cannot afford a new car.

ii. I offered him a job.

iii. This job does not offer any prospects for promotion.

10. **Encroachment** (noun) – Intrusion on a person's territory, rights, etc. अतिक्रमण

11. **Gruesome** (adjective) –grisly, frightful, horrifying, fearful, hideous, macabre, horrible
भीषण/भयानक

12. **Blasphemous** (adjective) – sacrilegious, profane, irreligious, irreverent, impious, तिरस्कारी,
निंदात्मक

13. **Astonishing** (adjective) – amazing, astounding, staggering, shocking आश्चर्यजनक

14. **Fallacious** (adjective) –Based on a mistaken belief; erroneous, false, untrue, wrong भ्रामक,
तर्कहीन

15. Replace 'Has' with 'have'

16. (A) **4123**

In the past, Iran's government had stayed away from Khomeini's fatwa. In 1998, Kamal Kharrazi, Foreign Minister in the government of reformist President Mohammad Khatami, announced in New York that Iran would not attempt to kill Rushdie. As it was generally interpreted as an informal revocation of the fatwa, the U.K. normalised ties with the Islamic Republic. But hardliners tightened their grip on Iran's institutions once Khatami's two terms came to an end in 2005.

17. **Edict** (noun) –decree, order, command, commandment, mandate आदेश/फ़र्मान

According to the given options only (i) and (ii) are contextually correct.

Because the (iii) sentence is not giving any meaning and correct sentence should be like

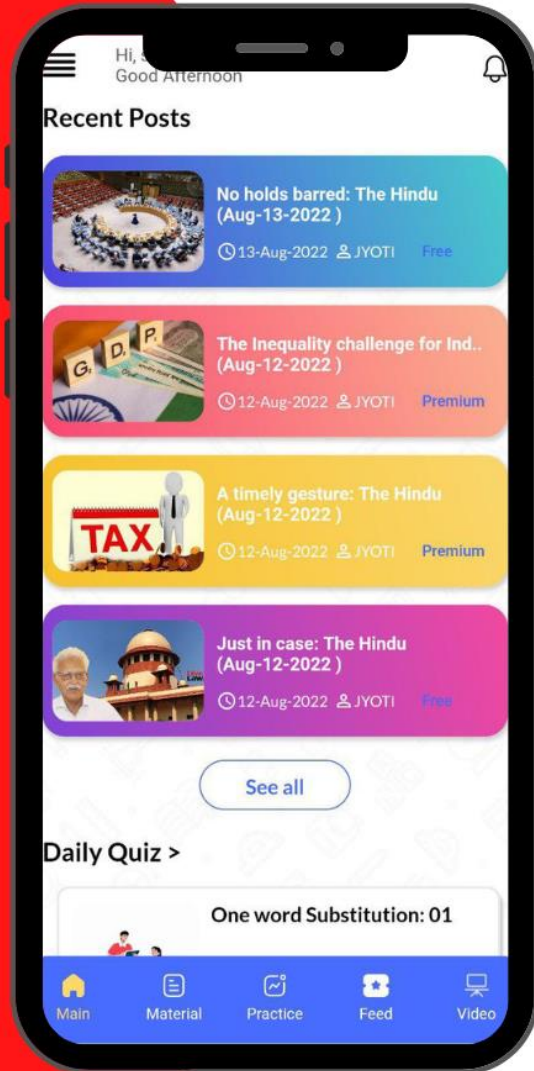
The complaint against the bar could lead to revocation of its licence.

18. Worse, pro-state media in Iran applauded "the courageous and duty-conscious man who attacked the apostate and depraved Salman Rushdie in New York".

19. **Although** chocolate is Alya's favorite food, she does not like chocolate with peanuts."

Explanation of other important words

Sr.NO	Words		Meanings	
Q1	Ephemeral	adjective	Lasting a very short time	अल्पकालिक
	Nefarious	adjective	Evil; flagrantly wicked	कुटिल
	Robust	adjective	Strong and healthy; vigorous	मजबूत
Q2	Castigate	verb	To criticize severely; to chastise	फटकारना, दंड देना
	Munificent	adjective	Very generous; lavish	उदार
	Abhor	verb	To hate very, very much; to detest	घृणा करना
Q3	Bovine	adjective	Cow related; cow like	गोजातीय
	Analogy	noun	A comparison of one thing to another; similarity	समानता
	Mercenary	noun	A hired soldier; someone who will do anything for money	किराये का
Q11	Cryptic	adjective	Mysterious; Mystifying	गुप्त, अप्रकट
	Stagnation	noun	Motionless; inactivity	स्थिरता
	Dormant	adjective	Inactive; as though asleep; asleep	निष्क्रिय
Q12	Hapless	adjective	Unlucky	अभागी
	Fatuous	adjective	Foolish; silly; idiotic	बुद्धिहीन, मूर्ख
	Foment	verb	To stir up; to instigate	भड़काना,
Q13	Lethargy	noun	Sluggishness; Laziness; drowsiness; Indifference	सुस्ती
	Prodigy	noun	An extremely talented child; an extraordinary accomplishment	विलक्षण गुण-संपन्न मनुष्य
	Contiguous	adjective	Side by side; Adjoining	मिला हुआ, पास का
Q14	Autonomous	adjective	Acting independently	स्वायत्त, स्वशासी
	Antipathy	noun	Firm dislike; a dislike	घृणा, चिढ़
	duplicity	noun	The art of being two faced; double – dealing; deception	कपट, द्वैधता,



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