```
= What is a Knowledge Graph
:order: 1
:type: lesson


[.slide.discrete]
== Knowledge Graphs
[quote]
A knowledge graph is an organized representation of real-world entities
and their relationships.

Knowledge graphs provide a structured way to represent entities, their
attributes, and their relationships, allowing for a comprehensive and
interconnected understanding of the information.

Knowledge graphs are useful for Generative AI applications because they
provide structured, interconnected data that enhances context, reasoning,
and accuracy in generated responses.

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== Search Engines

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Search engines typically use knowledge graphs to provide information about
people, places, and things.

This knowledge graph could represent Neo4j:
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[.col]
image::images/neo4j-google-knowledge-graph.svg["An example of a knowledge
graph of Neo4j showing the relationships between people, places, and
things", width=90%]

[.slide.discrete.col-2]
== Data sources

[.col]
====
Knowledge graphs can break down sources of information and integrate them,
allowing you to see the relationships between the data.

This integration from diverse sources gives knowledge graphs a more
holistic view and facilitates complex queries, analytics, and insights.

Knowledge graphs can readily adapt and evolve as they grow, taking on new
information and structure changes.
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[.col]
image::images/generic-knowledge-graph.svg[a diagram of an abstract
knowledge graph showing how sources contain chunks of data about topics
which can be related to other topics]

[.transcript-only]
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Neo4j is well-suited for representing and querying complex, interconnected
data in Knowledge Graphs.
Unlike traditional relational databases, which use tables and rows, Neo4j
uses a graph-based model with nodes and relationships.
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== Organizing principles

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A knowledge graph stores data and relationships alongside frameworks known
as organizing principles.

The organizing principles are the rules or categories around the data that
provide structure to the data.
Organizing principles can range from simple data descriptions, for
example, describing a GraphAcademy course as `course -> modules ->
lessons`, to a complex vocabulary of the complete solution.

Knowledge graphs are inherently flexible, and you can change the
organizing principles as the data grows and changes.

The organizing principles describing the content in GraphAcademy could
look like this:
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[.col]
image::images/org-principles.svg[A Graph showing 4 types of content]

[.slide.discrete.col-40-60]
== Organizing principles

[.col]
====
The organizing principles are stored as nodes in the graph and can be
stored alongside the actual data.

This integration of organizing principles and data allows for complex
queries and analytics to be performed.

Mapping the organizing principles to the lesson content in GraphAcademy
could look like this:
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[.col]
image::images/org-principles-with-data.svg[A Graph showing the organizing
principles and the lesson content]
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[.slide]
== Generative AI applications

In Generative AI applications, knowledge graphs play a crucial role by
capturing and organizing important domain-specific or proprietary company
information. They are not limited to strictly structured dataâ€”knowledge
graphs can also integrate and represent less organized or unstructured
information.

GraphRAG can use knowledge graphs for context, forming the foundation for
applications that leverage proprietary or domain-specific data. By
grounding responses in a knowledge graph, these applications can provide
more accurate answers and greater _explainability_, thanks to the rich
context and relationships present in the data.

[.quiz]
== Check Your Understanding

include::questions/1-knowledge-graphs.adoc[leveloffset=+1]


[.summary]
== Lesson Summary

In this lesson, you learned about knowledge graphs and how they are an
organized representation of real-world entities and their relationships.

You can learn more in the Neo4j blog post
link:https://neo4j.com/blog/what-is-knowledge-graph[What Is a Knowledge
Graph?^].

In the next lesson, you will learn about the process of constructing
knowledge graphs.
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